Vol. 4 JULY, 1922 No. 4

THE PAPER INDUSTRY

The Monthly Educational Journal of the Paper Indu

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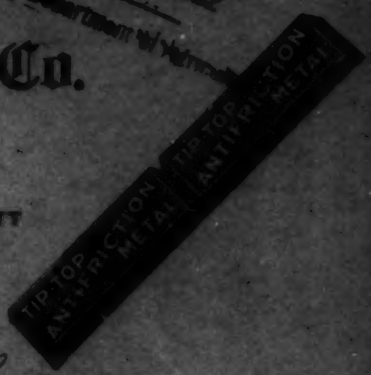

HOBOKEN, N. J.

DC.

July 1st, 1922.

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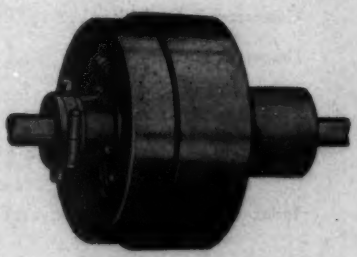

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Vol. 4—No. 4

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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Again We Say—

FOR several months past we have been saying that the wise merchant would "buy his paper now." Every one of them who has taken our advice has profited thereby, for there never has been a period in the history of American business within the last 25 years when stocks of paper in the hands of general consumers were so low as they are today.

The paper business is dependent upon the condition of general business, and general business has been on the slow and steady upturn for the past six months. One of the most significant barometers of trade conditions that appeared is contained in the following resumé taken from the Federal Reserve report:

The Index Number of wholesale prices in the United States compiled by the Federal Reserve Board shows that the prices during May increased 9 points or 6%. All figures are based on the average prices for 1913 at 100%. Imported goods advanced 4% to 119 and domestic goods 9 points to 158. The average index price touched a "low" of 142 a year ago. Prices fluctuated between 142 and 146 until March, 1922, when the index figure moved up to 147. Now, at 155 for May, the advance from January amounts to 16 points or approximately 10%.

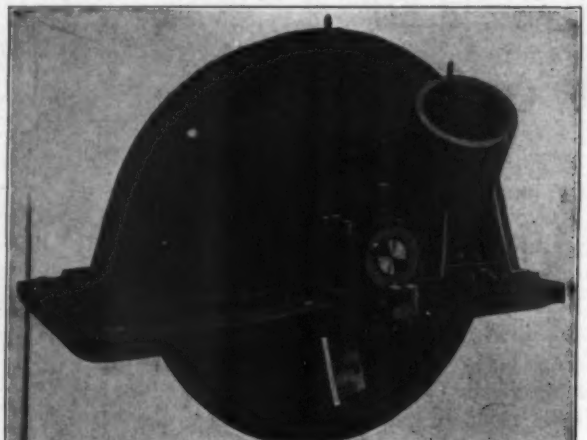
The significance of all this lies in the fact that during the first three months, prices stabilized and then the readjustment gradually took place until we now have a price advance in all of the wholesale list equal to 10%, and this is not all. The advances have just begun.

The country has been on a very foolish buying strike, superinduced more or less by foolish purchasing agents who overbought when they should not, and then refused to buy when they should. The result is that in all lines of commodities as well as paper, there are no reserve stocks in either consumers' or jobbers' hands.

Beginning now with the second six months of 1922, a very heavy replenishment purchase period may be looked for, and by September even without any ill effects of the coal strike, which scarcely could be avoided, and even leaving out of consideration any labor trouble or interruption of transportation by the shop men and "maintenance of way" men on the railroads, there is bound to be a remarkable upturn in values, and a probable return to a demand for commodities parelleling that of 1920.

Our advice to every reader of THE PAPER INDUSTRY is to "Buy your paper now." We believe the whole market to be a purchase, from tissue to board, and incidentally we would not neglect to keep on buying some coal wherever we could get it, especially as long as the coal strike remains unsettled.

Pulp and Paper Mill Machinery



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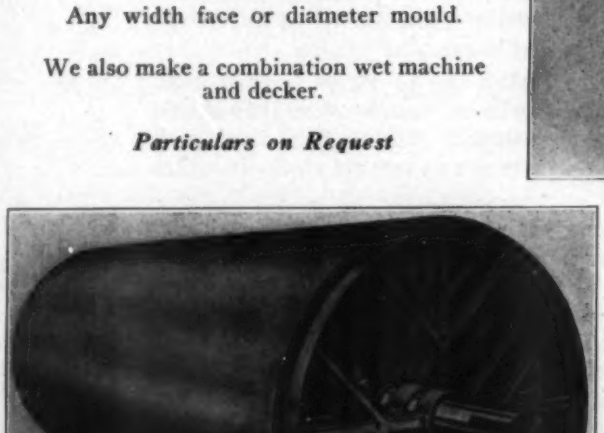

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Business Sense

By IKE KENNEDY

Appreciation

WHAT stingeth like the indifference of the unappreciative? Is it forgetfulness, carelessness, selfishness, or just plain unvarnished cussedness that makes us forget to do the things that would cost us so little and return us so much?

What affords us more cheer, more incentive for greater, nobler striving than appreciation?

We like it, of course we like it; some of us fairly exist on it. Some of us neither ask nor expect any other reward, and oh, how we miss it.

A good dinner at home isn't a thing that has a cash register staring us in the face at the end of a self serve counter! It is something that has a personality baked or broiled into every atom of it. Something that has been planned because you like it, served as you like it, and with as much good cheer as your blasé temperament will accept; and have you neglected to even mention that it was good? It's always good and you know it; but who else knows it? The faithful little girl behind that dinner might appreciate something else aside from your usual display of eagerness in disposing of it! The good Mother who sacrifices everything for the appearance of her family might sometimes possibly be in a receptive mood for a little affection, and Dad, possibly they haven't given you a fair shake, possibly they imagine you are so indifferent to this sort of thing that you don't want any of it, wouldn't understand it!

Where does this thing that makes for so much happiness really start anyhow? Who flung it away—who first started the idea that it has no purchasing power? Who first forsook it as a thing apart from the little niceties of home, of business and of life; certainly not you?

Who thanks our public servants for the labor expended far and beyond the rewards of their office?

Who stops to thank the postman for his little extra courtesies?

Who thanks the policeman for his part in this great battle with the irksome duties of his daily job?

Who for a minute gives a tinker's damn for the engineer who has piloted us safely through a long and trying journey; who has given him a thought? That's his job, he's on a par with Mary Ann, he's paid for it!

Who appreciates the blessings of good health but the sickly? Who appreciates that we have been exceptionally fortunate among nations—and who's thanking God for it?—mighty few—mighty few. Come on, let's not wait for Billy Sunday to fill in with emotion; let's pull the clinkers out of the old furnace of love; let's be just a wee bit sentimental if we may, but let's start something different, let's learn to be appreciative, not only of home, but of life in general.

Open the day as you would a Christmas box, and close it as you would the pages of the last chapter of a beautiful story. It won't hurt.

Confidence

THERE is an old saying that "a bone carrying dog will take a bone," and another, that what you can't keep yourself you needn't expect it to be kept by others.

Here you have something vitally important to your well being, a real secret, that will either hurt you or some one else, and you spill it like Mary spilled the oil on the kitchen stove, where a fire ought to be perhaps, but she couldn't regulate it without the assistance of the fire department.

As long as you held it and controlled it, it was harmless—but you gave it air and some one else opened the draft and went off and forgot the charge.

It's all over town now, common property, misconstrued and misshapen, a stray dog, without a muzzle, running rampant, with a can tied to its tail, a mad dog scare, all because your tongue wagged in the middle.

It's all right to be trusting, absolutely right to be frank and honest if you will keep your nose away from the muzzle end of the gun which fires your ammunition. A leak is a leak, if you are a leaky vessel it would be well to consult the plumber of common sense before you find a place on the dump heap of discarded friendship.

Nothing bites harder or stings deeper than a betrayer of confidence. It is "old ingratitude," gaunt and naked and revealed in all his hideousness.

Yet you meant no harm, how could you, you only wanted to be entertaining, you were only exchanging confidences, but you were cheated in the trade, because you did not value the prize in your keeping. Lincoln said that a bad bargain is better broken than kept.

If you know your weakness, head off the confiding one, don't be burdened with information that will make you miserable until you shift the burden to the next fellow, don't become an "accessory after the fact," don't put yourself in a position to be called as a witness, don't tie yourself up in a hopeless tangle of broken friendships just to be entertaining, and offer gossip as a bribe for further gossip. If you have a prized bit of information don't cheapen it by making it common property. Is it any wonder we can count our friends on the fingers of one hand? Is it any wonder that we have to submit our acquaintances to the "third degree" for legitimate information when the party lines are hot and the wire busy in the code language of the betrayer?

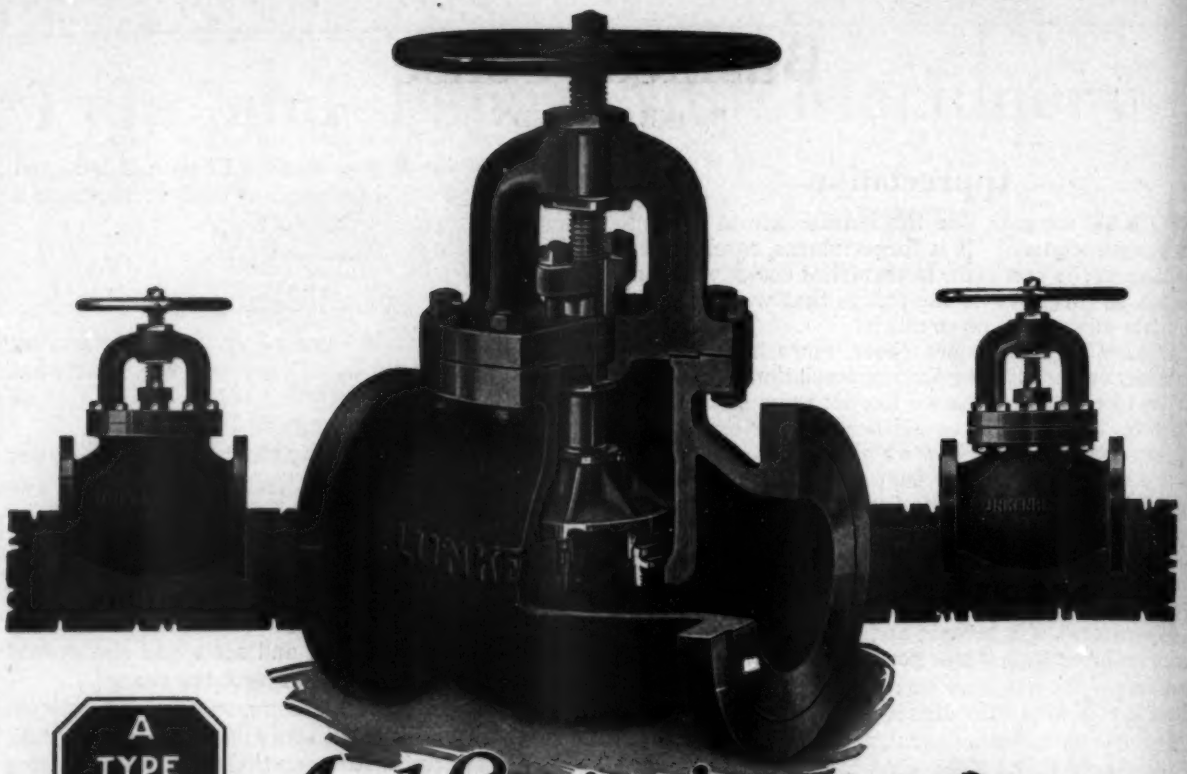

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Fig. 606 Cast Steel

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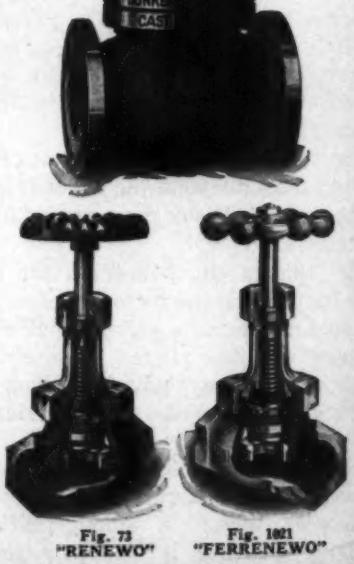

Fig. 73 "RENEWO"

Fig. 1021 "FERRENEWO"

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The Sensitiveness of Credit

By J. H. TREGOE
Secretary-Treasurer, National Association of Credit Men

THE human system in its function and organs is far hardier than the credit system has proved to be. The intangible nature of credit is probably the reason. We cannot understand well things we are unable to handle. There hasn't been that careful research into credit which experts have directed into other difficult fields. Credit as a medium of exchange is founded on confidence, and confidence is reflected in the three C's. In the exchange of commodities for a promise, written or implied, the buyer receives the commodities and the seller receives the credit. We imagine usually that the commodities and the credits are alike received by the buyer.

Credit is very sensitive to social disturbances. At times this sensitiveness is found where the disturbances are very slight. The cause and the effect are frequently remote from one another. In illustration: The Conference for the Limitation of Armaments, closing as it did in a burst of glory, and meeting our fondest expectations, will ultimately affect the credit system. This happens because the Conference has brushed aside war clouds and tends to good order in the living of nations with one another. This guarantee of peace will accelerate credit and bring a larger flow of it into international channels. Furthermore, the effects of the Conference should tend to a reduction in taxation burdens. This will have a favorable reaction on the credit system.

Credit shrivels up when business is making nothing more than a bare living. Burdens on business hurt confidence, and hurt to confidence destroys credit. At the present time certain parts of the world need food and other commodities. We have food and these commodities, but just how to get them into the hands of those who need them is our problem, and it is a problem because credit is not flowing in an unhindered channel.

There are but three ways to pay for commodities or services, barter, money and credit. The first two are not adaptable in our present commerce and the third, while very adaptable, yet is susceptible to disturbances to the point that it will become materially affected and decrease to the extent of producing a depression. We must have social order, political order, commercial order, for a perfectly healthful credit system. When we speak of economic instability, we speak in the terms of a disordered credit system.

When we say business is bad, we mean that the flow of commodities from producer to consumer has been hindered by a poor flow of credit. At the present time we have undiminished credit facilities. Our purchasing power as represented in credit terms is very large, but this power cannot be used when confidence is at a low ebb and the purchasing power unequally distributed.

Getting back to prosperity means nothing more or less than restoring health to the credit system. Watch it carefully; watch it with an attentive eye, so that we may learn our lesson and understand that prosperous business is allied to sound and liquid credit.

We are striving hard to bring the business public into a recognition of the interrelations of credit and commerce, that they cannot be divorced and commerce survive. Why play fast and loose with something of such superior value to our social happiness and contentment? Why not endeavor earnestly to so conduct our affairs and insist upon the conduct of national and international affairs to the end that credit may flow unhindered and business be prosperous always?

When the Purchasing Department Ran Amuck

IN a recent journey I came across a rather unhappy incident. An Eastern commercial house, generations old and with a remarkable record, and bearing a name of high repute, went into receiver's hands. Why did such an unfortunate termination come to this splendid enterprise? Was it avoidable? Was it the result of a serious mistake?

The story is that the purchasing department of this enterprise ran amuck, bought goods right and left without any thought of the future, under the excitement of the hectic days when buying was outdistancing prudence. The scene changed. Values declined. The capital was wiped out. The last chapter was a receivership.

This is but one vivid instance of the business crimes of 1919 and 1920. A single department overstepped the boundaries of discretion, had no thought of the future. What if the purchasing department had consulted the credit department, if conferences had taken place about the future and as to what would be a prudent amount of buying? A different story would have been told. Disaster would have been averted. Unless the departments of an enterprise function as one, there are dangers ahead and success is made more difficult. Ignorance of economic laws, of the business cycle, was at the base of our criminal mistakes in the two hectic years, mistakes that have impaired capital, brought us into a period of depression and quieted our enterprise when there is a tremendous amount of potential buying power in the Nation. Shall we repeat these mistakes? Heaven forbid! Chains must be thrown around the recalcitrant department of a business that wants to play the game alone. The credit department must be the balance wheel of an enterprise. Conservatism combined with progressiveness must ever be motto of the credit department. It should know the reefs and the channels of trade. It should know how the business ship is to be piloted safely into the port of success.

I would offer this admonition even though my training had been in some other department than credit. I have been horrified at the sight of the wrecks resulting from the criminal mistakes of the two fevered years. I have wondered often why it was that so much economic ignorance pervaded the land, was found indeed in its highest places. Credit is the child of certain well defined laws: not to know these laws is too frequently the cause of mistakes in those who deal with credit.

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FUEL RETARDERS

How Bleaching Effects the Strength of Fibers

By E. SUTERMEISTER

The following article is the result of a continuation of experimenting on this problem by which certain conclusions had been reached and stated in a former paper by the same author. Further interest in the subject is solicited with the hope that discussions will follow.—Editor.

IN a paper by the writer on the "Effect of Bleaching on Fibers," published in THE PAPER INDUSTRY for March, 1922 brief mention was made of the effect of bleaching upon the strength of the stock and it was stated that the results of Frohberg were quite the opposite of those obtained by the writer. Because of this difference in the conclusions reached, and because of the far-reaching effects which any marked changes in the strength of the fibers might cause in the papers manufactured from them, it was thought desirable to carry out further investigations along this line. This work has now been completed and the results appear to be of sufficient interest to justify their publication.

The method employed in carrying out the tests is as follows. The fiber selected for the tests was either taken from a single roll, or in case more than one roll was sampled that portion used in the tests was made up of equal parts by weight from each of the rolls. If the fiber was available only in the slush form a large sample was thoroughly mixed and the samples for testing taken from this. In every case the stock used was thoroughly air dried before the samples were weighed out, and all the samples of any one kind which were to be used in the tests were prepared at one time, so that any changes in weight which might be caused by changes in atmospheric humidity were avoided.

Samples of 70 grams of each kind of fiber were then bleached with different amounts of bleach in steps of 3%, 4%, or 8% according to the type of fiber and its ease of bleaching. As soon as the bleach was exhausted the fiber was thrown on a wire bottom screen and thoroughly washed with a heavy spray of water. The washed fiber was then made into sheets and air dried. The percentage of bleach used was in most cases based on air dry fiber (containing 10% of moisture) but in a few cases the moisture was not determined and it was assumed that the moisture content of other fibers being weighed out at the same time applied equally well to the sample in question. From the slight variations in moisture among the samples tested it is certain that any error caused by this assumption would be quite insignificant. All bleachings were made in glass battery jars, with continuous agitation, and at a practically constant temperature of 35° C. It was found impossible to maintain this temperature exactly, but if variations of more than 2° either way were known to have taken place the samples were discarded and others bleached to take their places. In most cases the temperature did not vary more than half a degree above or below the desired point. The density of the stock during bleaching was not determined, but as the same amount of fiber was used and the jars filled to about the same point, it is evident that no serious variation occurred. The bleach used with each kind of fiber varied from that which gave a very yellow, or even brown, product to that which produced a white which was very considerably above the average commercial color. An exception to this statement is the kraft fiber, for it was found impractical to bleach this quite up to the standard color for sulphite.

After all bleachings were completed on any one fiber the air dried samples were laid out together so that all might come to the same moisture content, and then samples of 50 grams were weighed out for use in the beating test. Each sample was broken down to a pulp in 2,000 cc. of water and the entire quantity placed in a small pebble mill. It was then beaten for just one hour, the beaten pulp made up to a definite volume and nine sheets from each lot made on a sheet machine, using a definite volume of the standard pulp mixture for each sheet. This insured uniform sheets, both as regards weight and formation, and avoided much of the personal equation which plays so important a part when the sheets are made on a hand mould. The wet sheets were pressed between felts in a small press and were then spread on racks and allowed to dry in the air without any application of heat. The dried sheets were pressed for some time in a copying press, but as it proved impossible to get them sufficiently smooth to avoid calender cutting, they were not calendered. All beatings were made in the same jar and all sheets made by the same person in order to avoid any possible errors from these sources.

When all test sheets from any one kind of fiber were ready they were tested for bursting, tearing and folding strength on the Ashcroft, Elmendorf and Schopper testers respectively. For the bursting and tearing tests four sheets were selected and cut in

half along one diagonal. The samples for tearing were taken from one half, and were cut parallel to the diagonal, so that the tear was made approximately along the other diagonal. The length of strips obtainable made it possible to make seven tears on each sample, using the four strips together in the tester. The results given are the average of the seven tests. The other halves of the sheets were tested for bursting strength making five tests along the diagonal on each sheet. The figures recorded are the averages of twenty tests on each sample.

The folding tests were made on twelve strips from each sample, cut from two sheets. From one sheet

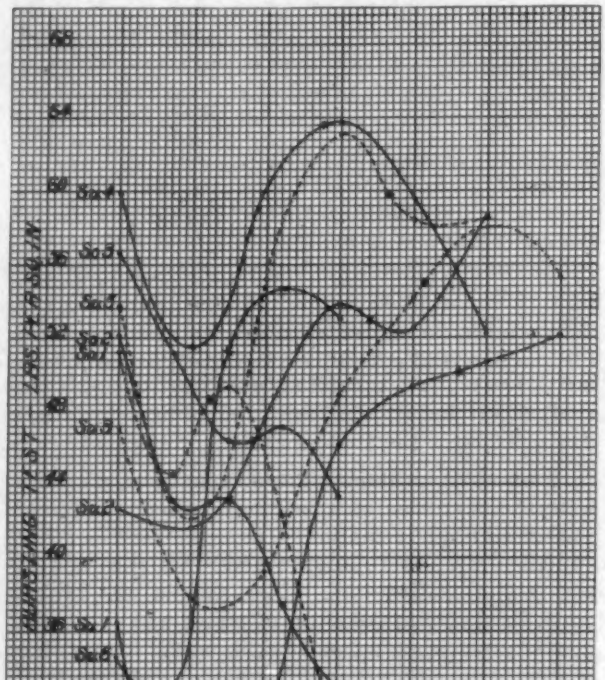


Chart 1

three strips were cut parallel to one of the sides and three others at right angles to the first; from the other sheet three strips were cut parallel to each of the diagonals. In making the folding tests, and also the bursting tests, the test-pieces from all bleachings of any one kind of fiber were laid out and a strip tested from each lot, running over the lots in rotation, rather than testing all strips from any one lot before going to the next one. In this way any possible change in atmospheric humidity taking place during the testing of any set of samples would affect all samples equally and the average results should give reliable comparisons. This precaution makes possible a comparison between all samples of any one brand of fiber but it does not insure the same degree of accuracy when comparing different brands, for a constant humidity room was not available and the tests are subject to such variations of humidity as would normally take place from day to day in any well ventilated building. The only exception to this statement is in the case of kraft fiber and sulphite Su5 which were laid out and tested as a unit so that the numerical results of these two samples may be compared directly.

The tests were made in two groups, the first appearing so interesting that it was thought best to repeat part of the work to check the results. In all ten different samples of fiber have been tested, six of sulphite, three of soda fiber and one of kraft fiber. The sulphites were of three different makes but comparatively little is known of the nature of the wood used, nor were the exact cooking conditions recorded. The soda fiber was made from a mixture of poplar and hard woods, while practically nothing can be said about the kraft fiber beyond the fact that it was a Canadian product originally shipped in a damp condition but that it had been on hand in the air dry state for six months before the tests were started.

The percentages of bleach required to bring these fibers to good commercial standards for color are given in the following table. The percentages are based on fiber containing 10 percent of moisture. The standard color for soda fiber was distinctly lower than that for sulphite but both would be considered in most cases as commercially acceptable for their respective classes.

Sample No.	Fiber	Bleach required Percent
Su 1	Sulphite No. 1 Sample 1	18.5
Su 2	Sulphite No. 1 Sample 2	13.7
Su 3	Sulphite No. 1 Sample 3	16.6
Su 4	Sulphite No. 2 Sample 1	11.0
Su 5	Sulphite No. 2 Sample 2	14.6
Su 6	Sulphite No. 3 Sample 1	5.9
So 1	Soda No. 1 Sample 1	5.0
So 2	Soda No. 1 Sample 2	6.0
So 3	Soda No. 2 Sample 1	7.3
K 1	Kraft	

The bleach required for kraft fiber is not given because the tests were not carried far enough to reach the standard color for sulphite, or even quite reach that for soda, though as much as 40 percent of bleach was used.

The physical tests of the air dry sheets of beaten fiber gave the following results:

Bursting Test in Pounds per Square Inch

Percent bleach used	Su 1	Su 2	Su 3	Su 4	Su 5	Su 6	So 1	So 2	So 3	K 1
0	36.5	42.7	47.1	59.9	53.7	34.6	51.2	52.1	56.6	68.5
3	....	....	....	....	....	32.9	44.6	43.1	51.2	....
4	28.4	41.6	37.7	51.5	42.1	....	....	....	....	....
6	....	....	....	....	....	51.5	49.3	43.2	46.4	....
8	30.7	47.6	39.2	60.3	55.2	....	....	....	....	53.9
9	....	....	....	....	....	54.7	42.2	37.4	47.1	....
12	46.2	53.8	48.9	63.8	63.1	53.0	29.8	32.9	43.3	....
16	49.3	52.5	54.2	59.6	58.4	....	....	....	....	62.7
20	50.6	58.7	58.0	52.2	58.6	....	....	....	....	....
24	52.1	....	55.3	....	....	....	....	....	....	76.7
32	....	....	....	....	....	....	....	....	....	79.5
40	....	....	....	....	....	....	....	....	....	79.3

Tearing Test in Grams

Percent bleach used	Su 1	Su 2	Su 3	Su 4	Su 5	Su 6	So 1	So 2	So 3	K 1
0	148	194	176	126	154	160	83	89	76	331
3	...	...	...	...	...	269	75	76	76	...
4	184	179	204	135	157	...	...	...	...	...
6	...	...	...	...	...	...	65	64	72	...
8	164	190	231	135	152	...	..	..	..	372
9	...	...	...	...	...	160	61	52	60	...
12	168	190	217	127	128	136	43	49	46	...
16	164	154	184	133	128	...	..	..	..	384
20	136	134	156	94	113	...	..	..	..	...
24	124	...	172	...	...	...	..	..	..	320
32	...	...	...	...	...	...	..	..	..	230
40	...	...	...	...	...	...	..	..	..	186

Folding Test—Double Folds

Percent bleach used	Su 1	Su 2	Su 3	Su 4	Su 5	Su 6	So 1	So 2	So 3	K 1
0	48	75	202	102	221	34	15	29	43	1486
3	..	..	...	...	...	26	15	16	40	....
4	21	52	71	137	82	..	..	..	..	....
6	..	..	..	...	...	134	11	9	29	....
8	28	229	76	145	195	...	..	..	..	234
9	...	...	...	...	...	154	1.5	2	8	....
12	161	336	217	127	311	105	0.5	1	1.5	....
16	200	375	410	51	238	...	..	..	..	811
20	171	221	230	7	215	...	..	..	..	....
24	160	...	329	...	...	...	..	..	..	1909
32	...	...	...	...	...	...	..	..	..	1267
40	...	...	...	...	...	...	..	..	..	1043

All of these results, with the exception of those for kraft fiber, are shown graphically on charts 1, 2 and 3 for the bursting, tearing and folding tests respectively. The graphs for the kraft fiber were omitted because the numerical results were of so much greater magnitude than those for sulphite, and especially for soda, that if they had been included on charts of the size desired the scale would have had to be reduced so greatly that differences between the soda and sulphite fibers would not have been strongly enough marked.

Results Shown in Tables and Charts

A study of the results given in the tables and the charts brings out the following points:

The bursting test of fibers bleached with three or four percent of bleach is, without exception, lower than that of the unbleached fiber, and this also holds true of the kraft fiber bleached with 8 percent of bleach. The extent of this decrease in strength ranges from 5.4 to 9.0 lbs. per sq. in. for soda fiber and from 1.1 to 11.6 lbs. for sulphites; the single sample of kraft fiber showed a decrease of 14.6 lbs. for the sample bleached with 8 percent. When more bleach is used the bursting strength rises, in the case of sulphite and kraft fiber, until it is greater than that of the unbleached fiber. There is finally a dropping off in strength with most of the sulphites, though in one or two cases there seems to be a continuous increase in strength, even when the bleaching is carried considerably beyond the point where the standard color is reached. It is interesting to note that the bursting strength of sulphite bleached to the standard color is invariably greater than that of the unbleached fiber. The kraft fiber also increases in bursting strength as the severity of bleaching increases and the maximum strength seems to be reached when about 32 percent of bleach is used. With soda fiber each sample shows a slight gain in strength with increased use of bleach, but the gain is comparatively small and in no case is the bleached fiber as strong as the unbleached. After this recovery in strength there is a further decline, so that for all practical purposes of paper making it may be said that the bursting strength of soda fiber from poplar and hard woods decreases continually as the severity of bleaching increases.

The results of the tearing test are somewhat irregular but in general the fibers fall into three groups. The soda fibers decrease in strength quite rapidly and regularly as the amount of bleach used

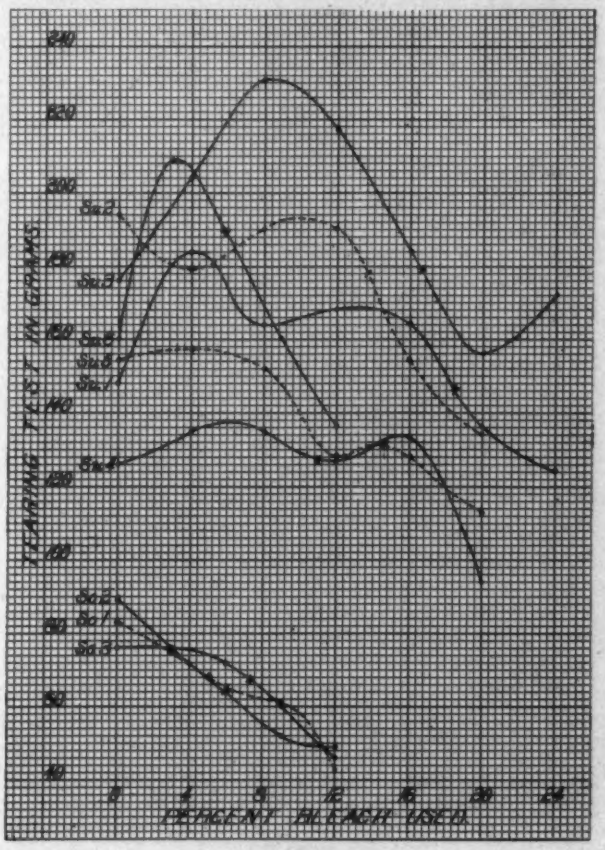


Chart II

increases. Three samples of sulphite, including Su 1, Su 3 and Su 6, at first increase in tearing strength and then decrease, so that the strength of the over-bleached fiber is less than that of the unbleached. Two other sulphites increase in strength only very slightly when small amounts of bleach are used and then decrease more gradually than the other three samples. One sample of sulphite, Su 2, does not seem to fall into any of these groups. The averages of the tearing tests of the six samples of sulphite when bleached to the standard color is the same, within one gram, as that of the unbleached fibers. The kraft fiber most closely resembles the first group of sulphites in that it shows at first an increase and

then a decrease in strength; the final strength is, however, much lower in proportion to the strength unbleached than in the case of any of the sulphites.

The folding test, so far as sulphite fibers are concerned, is somewhat similar to the bursting test in the form of curve which it gives. There is at first a decrease in the number of folds necessary to break the strips where 3 or 4 percent of bleach is used. Following this an increased amount of bleach causes an increase in strength until a point is reached where the strength is much greater than that of the unbleached fiber. After this the strength declines again but unless the over-bleaching is excessive it does not

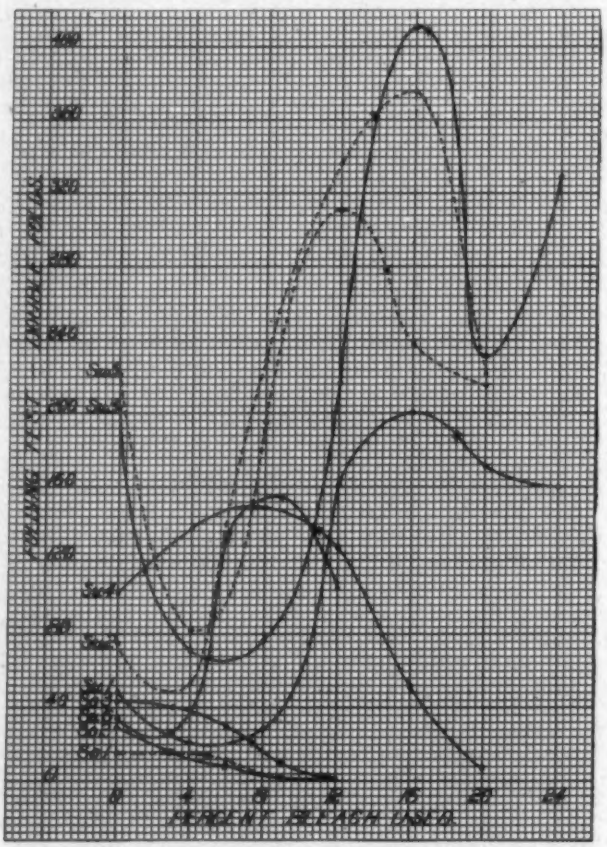


Chart III

drop below the folding test for the unbleached product. With all the sulphites the folding strength when the standard color is reached is considerably greater than that of the unbleached fiber. Sample Su 4 appears to be an exception to the general rule for it does not show the initial drop in strength but rises from the start to a maximum and then falls to a point far below the strength of the unbleached fiber. It has proved impossible to find any reason for the unusual curve which this fiber gives and unfortunately the exact cooking conditions under which it was prepared are not known. It is believed, however, that it must have been abnormal in some way, since none of the other five sulphites show the characteristics of this curve, though one of them was prepared in the same mill with the abnormal one.

The folding tests on soda fiber show a consistent decrease in strength as bleaching proceeds until the most over-bleached fiber has practically no folding strength. The drop in strength, followed by an increase, which seems to be characteristic of the sulphites is entirely absent in the soda fibers. Kraft fiber again resembles the sulphites more closely than the soda fibers for it shows at first a decrease in strength, then an increase and finally a second reduction in strength. The maximum strength developed in the bleached fiber is considerably above that of the unbleached fiber but the final decline in strength carries it below the latter. In this respect it differs from most of the sulphites.

Considering the bleach required to produce the standard color to which the sulphites were bleached it is seen that this coincides quite closely with the maximum for bursting and folding strength. (The point at which the standard color is reached is shown on each of the graphs by an x.) Since the standard color was one which would be considered satisfactory in most paper mills, it is evident that through practical experience the trade has settled upon a color which can be maintained while at the same time producing fibers which are capable of developing the greatest folding and bursting strength. On the other hand, if the maximum tearing strength is desired the bleaching must be stopped far short of the standard color.

In the previous issue of this journal, to which reference has already been made, it was stated in regard to the folding and bursting strengths that bleaching increased the strength of sulphite even when the color produced was much whiter than that usually accepted by the trade as satisfactory, but that over-bleaching tended to reduce the strength from the maximum reached by the normally bleached material. The present investigation has been much more comprehensive in its scope than the previous work but it confirms the former conclusions regarding sulphite fiber and also the statement that the strength of soda fiber decreased as the bleaching increased in severity.

Methods of Testing Compared

As already stated these results contradict those of Frohberg, but as the two separate investigations of the writer confirm each other so well it was thought best to go over Frohberg's original paper * and note any important differences in the methods of carrying out the tests. The writer's method has already been described. Frohberg prepared his bleached fiber in a beater, adding an excess of bleach, determining the amount remaining at the end of the bleaching by titrating an aliquot part, and from this calculating the amount used up. The temperature of bleaching was 45° C., or less, and the bleach

* Wochbl. Papierfabr. 44, 1913, 3599.

solution used was strongly alkaline from the presence of calcium hydroxide. Beating was carried out in a hollander of 16 litres capacity using 450 grams air dry fiber and beating exactly 15 minutes; the pressure of the roll on the bed plate was maintained constant by means of a lever and weights. Eight litres of the beaten stock were diluted to 60 litres and fifteen sheets, 25x32 c. m. were prepared under uniform conditions of couching, pressing, drying and calendering, so that differences from any of these sources would be avoided. Of the sheets made only those which were free from defects were tested. All tests of the sheets made were carried out at constant temperature and humidity.

Obviously there are several points of difference in the two methods, those which might possibly cause differences in the results being as follows:

	Frohberg	Sutermeister
Method of beating	Hollander	Pebble mill
Method of making sheets	Hand mould Pressed	Sheet machine using constant volume
	Steam dried Calendered	Pressed Air dried Not calendered

Making all possible allowance for the differences in methods it seems as though they were hardly great enough to cause an actual reversal in the results obtained. Nor does a consideration of the methods offer any explanation of the fact that Frohberg found in one case a decrease in folding strength from 380 to 119 when the bleach was increased from 12.2 to 13.9 percent, while a fiber of apparently similar bleaching properties tested by the writer was found to decrease in strength from 375 to only 221 double folds when the bleach was increased from 16 to 20 percent, a much greater degree of overbleaching.

Unfortunately, the results given by Frohberg relate to the raw fiber and only one bleached product, or to two bleached samples without the unbleached fiber. This makes it impossible to plot curves showing the changes in strength as bleaching proceeds in the fibers with which he worked.

The results of this series of experiments are of importance because of the direct bearing which they have upon the production of white papers with the maximum strength of any given type. For this reason alone they justify the time and expense necessary in conducting the investigation. But apart from this aspect of the case they are of interest as affording a chance to speculate a little upon the interrelation of bleaching, beating, and strength of product. The few remarks which follow should, therefore, be considered as along this line and not as proved facts.

Speculation

From the tests on soda fibers it is seen that in comparison with sulphite they have very little tearing or folding strength but very good bursting strength, unless very much over-bleached. Is the reason for this lack of tearing and folding strength the shortness of the fiber or the chemical change induced by bleaching? Or is it possible that different types of beating, such as the difference between a pebble mill and a beating engine, produce different types of strength in the fiber? Because the unbleached fiber has little tearing or folding strength it is believed that the length of fiber is the controlling factor in this case, yet the possibility of developing such strength by a suitable method of beating offers an interesting field for investigation.

With many of the sulphite fibers the conditions which produce a drop in bursting and folding strength when a small amount of bleach is used cause an increase in the tearing strength, while as the bleaching proceeds and the bursting and folding strength rise the tearing strength falls. It is apparent that conditions which are favorable for producing one type of strength are inimical to the other. It is possible that this may be explained by considering the strength of a sheet as being composed of two factors, the slip of the fibers upon one another, and the breaking of individual fibers. If it is assumed that the slightly bleached fibers are somewhat hard and stiff and not easily affected by beating it would be expected that the sheets made from them would be comparatively soft, punky and fuzzy, and this is exactly what was found in the experiments. This type of sheet has a good tearing strength but low bursting and folding strength because the fibers are more or less free to slip upon one another. When bleaching is carried further the fibers are changed in character so that they appear to hydrate more during beating and the sheets made are dense, hard, rattly and free from fuzz. Such sheets have high bursting and folding strength but lower tearing strength than the softer sheets. Is this lower tearing strength due to the fibers being made more brittle by the bleaching treatment? If it is due to brittleness, why does not the folding strength also decrease? It is believed that this difference in the type of strength may be accounted for by the increased hydration of the more severely bleached fibers. This hydration has the effect of causing the fibers to adhere so strongly that on tearing they cannot slide upon one another but are obliged to break, giving the appearance of a weak or tender sheet. It is quite possible that by carrying the bleaching far enough the strength of the individual fibers would be so lowered that the folding as well as the tearing test would be decreased and this is apparently what happens in the case of certain of the fibers tested.

Each of the curves for bursting strength of soda fiber shows at one point a slight increase in strength followed by a further decrease. It is conceivable that this might be explained on the basis of the

relative effects of sliding or breaking of the fibers in the samples bleached to different degrees.

This paper, and more particularly that part of it relating to the speculations upon the reasons for changes in strength, is offered in the hope that it will bring forth some discussion, either in the trade journals or through correspondence. It is more than probable that others have done work along this line and it would be of benefit to all concerned if their results could be made generally available.

The Paper Pulp Industry in France

By W. P. MITCHELL

FRANCE produces about ninety thousand tons of wood pulp for the manufacture of paper and cardboard per annum. The consumption is about three hundred thousand tons, which necessitates an importation of virtually two hundred thousand tons per year.

To be entirely sustaining France will be obliged to have available 700,000 stères, or cubic metres, of suitable wood. It is well known that of the 25,000,000 stères produced by French forests, of which the total area is something like twenty million acres, and consumed for heating purposes, there could be readily found the 700,000 stères required for paper pulp necessary, especially since the thickly wooded slopes of the Vosges, in Alsace-Lorraine, have been returned to France. As for the future it is worth recalling en passant that the United States, in 1920, furnished nursery stock to France for tree planting and development to the extent of 25,000,000 roots.

Water power abounds in France, and several millions of additional H. P. could be readily installed in the Alps and Pyrenees. The Rhone and the Rhine could furnish also an abundant force motrice. The production of these two hundred thousand tons of imported wood pulp would require 1,500,000 stères of wood, 200,000 tons of coal and for the various production processes and manipulations 10,000 kilowatts of electrical force.

There does not seem to have been any considerable effort made in France in recent years to increase the home pulp production, in spite of the great increase in the price thereof. Herein is an economic anomaly for France, this amongst many others.

The French have a long experience in the manufacture of paper, but for the manufacture of pulp it will be necessary to mobilize a large capital, exposed to rest comparatively unproductive for a more or less lengthy period, if foreign manufacturers of pulp lower their selling prices. Capital is not so scarce in France today as is commonly supposed.

The manufacturing proposition is as follows, which will perhaps prove at least interesting for comparison with like conditions in America.

Not less than ten mills, each producing 20,000 tons per year, would assure the output of the two hundred thousand tons actually imported per annum.

Each of the installations grouped in a favorably placed district would cost at the present ruling prices six million francs, supposing that the electrical power was provided from a single central station. If each mill was obliged to produce its own power (5,000 kilowatts) by steam, the cost alone for each plant would be double. If hydro-electric power was developed the cost would be three times the first mentioned.

Each plant would cost, as is seen, six million francs if the power came from a central station, twelve millions if steam generated power was used, and eighteen million francs if each was obliged to install its own hydro-electric power.

To this amount one must add in each case from two to three million francs per annum for running expenses. It is thus shown that the investment and the fonds de roulement, or working capital, are very considerable, so much so that this very fact, as much as any other, has deterred the French investor in the past from seeking to reduce imports of pulp from Sweden, Norway, Newfoundland or Germany. Today the case is different. The angle of activity is economically and industrially French in all things, with a determination to import as little of everything as possible.

After the inquiries made by Monsieur Bernard Navarre, one of the greatest of French paper makers recently returned from Germany, it was demonstrated that the type of plant that has been most successfully adopted there was one of a productive capacity of 100 tons per day, or 30,000 tons per year of working days. Seven such would at least be required to produce the two hundred thousand odd tons which should supplant the previous imports into France.

The total investment for grounds, buildings and equipment would not be far from forty million francs, in addition to which these seven mills would require at least another ten million surplus to represent a working capital.

The production and sale of the printed word in France was a big factor previous to the war. The French have a saying that: "A civilized country can not go without paper," but paradoxically go back on their argument by adding a rider to the effect that "the manufacture of paper in France can never become a national industry."

Literally, going to the root of things, we learn that this is because the production of wood is not sufficient to assure the pulp required for the paper needs of the

country. France will not stop spinning because she is obliged to import all her cotton and most of the wood she uses. The cotton mills of Alsace, the knit goods industry of Troyes and the famous draps of Elbeuf, Rouen and Turcoing stand supreme because of their specialties in the textile world.

It has been said that it is impossible to increase the forest area of France without diminishing that which is laid down in grain. This is probably an error; Italy with far more vision years ago, began to plant Canadian poplars for paper making use on the denuded slopes of the Alps and Appenines; France can do the same in the Alps and in the Pyrenees, but up to the present she has not done so, with the result that paper is higher in France today than in any of the great countries of earth.

Growth in Forest Area

An important paper read before a learned society by Nicol de Portmont, in 1920, stated that wood is so little the enemy of wheat that in 1820 France had 12,500,000 acres planted in wheat while the forests covered 17,000,000 acres. A hundred years later the country had 16,000,000 acres in wheat while the forest area had increased to 25,000,000 acres. The forests are shown to have increased and multiplied almost in parallel with the wheat fields of France. With the production of the latter the France of before the war was completely self-sustaining and the farmer, so far as the raw materials for the making of the ordinary grades of paper was concerned, was as 300 to 200 to the bad.

It is estimated that the Departments of the Gironde and the Landes furnish, outside of two million cubic metres of lumber suitable for constructional purposes, 1,300,000 cubic metres of fire wood, of which one-half, if used in the manufacture of wood pulp, would produce 100,000 tons. This is one-half of the shortage in home production as it stands today.

Generally considered France seems already to be able to produce sufficient cardboard and pasteboard for home use without importing. Importations for the year before the war (1913) were 1,213 tons; 1912, 1,462 tons; 1911, 1,432 tons. Exports were 1913, 2,897 tons; in 1912, 2,845 tons; in 1911, 2,286 tons. The exportation of cardboard and bristols for these same years were respectively 1,500, 1,400 and 1,200 tons.

France has absolutely neglected making use of esparto in her own paper making projects and has invariably sold this raw indigenous product of the north African province of Algeria to English markets, whose paper makers have in many instances sold the manufactured product back to France.

Esparto grass, or alfa, is an important fibrous material largely exported from Algeria, from Morocco to a lesser extent, and in some appreciable quantity from Spain to England. The plant constitutes one of the most valuable fibre yielding materials with which paper manufacturers have to deal.

The following statistics are eloquent:

Esparto (Alfa) Exported from Algeria

	Total (tons)	To France	Great Britain	Germany	Belgium	Spain	Portugal
1910.....	92,496	704	85,205	204	1,723	2,215	754
1913.....	112,647	859	104,217	22	1,329	4,441	965
1917.....	37,342	971	35,034	.....	.....	1,228	.....
1920.....	53,641	2,170	48,000	.....	573	2,018	818

It is just now reported in the Algiers press that the Société de Cellulose de l'Afrique du Nord, with a capital of 2,000,000 francs, is about to build the first paper pulp mill, at Ain-El-Majar, near Saida, on the railway from Oran to Colomb-Bechar, in the richest alfa region of this rich province. Here, at last, is a fighting chance for France to more than meet competition on this, one of the most useful grades of commercial print paper known. The same is true of a possible development in the French zone of Morocco, making use not only of esparto, but of the dwarf palm, or asphodel, found so plentifully in the wooded districts around the French-Moroccan capital of Rabat-Salé. The alfa (esparto) growths are mostly found in the Oudjda regions bordering upon the Algero-Moroccan frontier.

Power Plant Management

Pulverized Coal for Steam Boilers—Part I

By ROBERT JUNE, M. E.

THE gradual development in the use of pulverized coal in this country had its inception some thirty years ago in the application of this type of fuel to the production of cement. From cement furnaces its use gradually spread to metallurigical furnaces. Marked economies have been effected by its use in these fields, with the result that it is now being successfully applied to a great many types of furnaces, such as forging, continuous heating, bushelling, puddling, and open hearth.

It is estimated that ten million tons of coal are burned in the United States annually in this manner. Its use, therefore, is not new, nor is its equipment in an undeveloped state.

This fact is of considerable importance in considering one of the newer aspects of the use of pulverized coal, that is, its application to steam boilers. The problem has been principally that of adapting processes and equipment, already well developed, to the peculiar needs of the boiler room. The incentive has

been that of lowering the cost of power production. Owing to factors which will be discussed, the problem of lowering the cost of power production by means of pulverizing coal has not proven readily capable of solution. Power costs have been lowered in a great many cases, and the increasing cost of coal together with the opportunities which pulverizing offers to

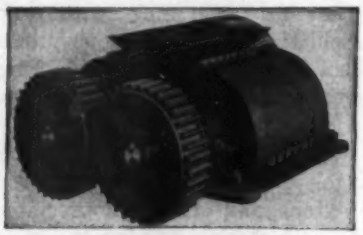


Fig. 1. Crushing rolls

use lower grades of coal, makes its wider application in the power field a certain event of the future.

Possibilities of Burning Lower Grade Coals

Practically any coal can be burned in pulverized form with a proper furnace and burner equipment. This means that coals from which very inefficient results have heretofore been obtained, can be brought within the reach of a great many consumers. For instance, the Western country from Texas to Alberta is underlaid with various grades of lignites, low grades of mineral coals with high moisture content, fuels of such a nature that the ash would melt or flow down on the grates if burned in the usual manner. The nature of these coals is such that they do not behave satisfactorily as gas producers. Consequently pulverizing offers unusual opportunities to burn these coals efficiently.

The following analyses are typical of these low grade Western coals which may be burned in pulverized form:

Kind of Coal	Fixed Carbon	Volatile	Ash	Moisture	B. t. u.
Mineral	45.22	26.39	20.38	8.01	10,940
McAlester	47.07	32.37	14.29	6.27	11,837
Lehigh	41.40	31.28	19.29	8.03	11,200
Lignite	25.50	33.95	7.58	32.97	7,548

The sulphur, separately determined, ranged from approximately 3 to 5 percent. in the various soft coals.

There are, around the average steel mill, large quantities of waste fuel such as coke breeze. This fuel is being used to a certain extent on some forms of grates, with forced draft, but it can be burned to very much greater advantage in pulverized form. Another possible use for this method of combustion is in the anthracite field where there are large quantities of coal in the form of dust and fine particles which accumulate as a result of washing and crushing operations, and which are then pumped back into the mines to fill up the old workings.

We do well to refer to the possibilities of burning low grade coals, in order to emphasize the wide application of the pulverizing process, but you must remember that its application is not necessarily limited to low grade coals, but that there is a very real possibility that the process can be used advantageously in competition with stokers for high grade coals.

What Is Pulverized Coal?

Pulverized coal is NOT coal ground to powder. Pulverized coal, to be considered as such, must be properly dried, crushed, and pulverized, so that the product contains a very high percentage of impalpable powder. To be satisfactorily burned by this process the coal must be ground so fine that at least 95 percent. will pass through a 100-mesh screen, that is, a screen having 10,000 openings to the square inch; and at least 85 percent. must pass through a 200-mesh screen, that is, a screen having 40,000 openings to the square inch.

The finer the coal is pulverized the more effectively will it be diffused when mixed with the air for combustion and the higher will be its efficiency in the furnace.

When a cubic inch of coal is pulverized so that 95 percent. passes through a 100-mesh screen, we have divided it into some 200,000,000 particles. Our original cubic inch of coal has a superficial area of 6 square inches, whereas the combined areas of this multitude of small particles is approximately 30 square feet, an increase of 700 times in exposed area.

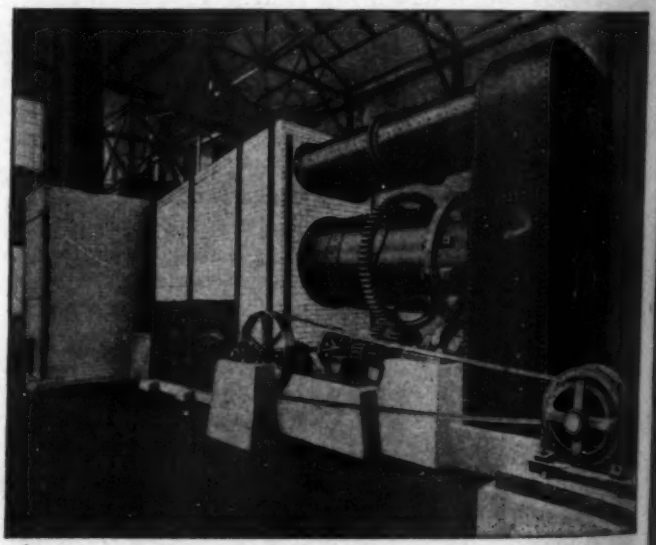


Fig. 2. Coal dryer (Fuller-Lehigh)

It is this exposed surface which permits perfect and instantaneous combustion.

Advantages and Disadvantages

Among the advantages of pulverized coal are the following:

1. It permits much wider variation in the quality of coal. The adaptability of stokers is limited. A stoker designed for one grade of coal will not handle

all other grades effectively. Pulverizing is of considerable advantage, therefore, where there are frequent variations in the grades of coal, or where much coal of low quality is encountered.

2. The pulverizing system is very flexible, permitting of very rapid increases of load. In this characteristic pulverized coal resembles oil and natural gas.

3. Standby losses can be very materially reduced. By taking the load off the boiler, shutting off the fuel, and closing up the furnace, a condition of incandescence can be maintained with the boiler pressure practically up to normal, for a period of hours. By throwing a switch, the entire firing operation can

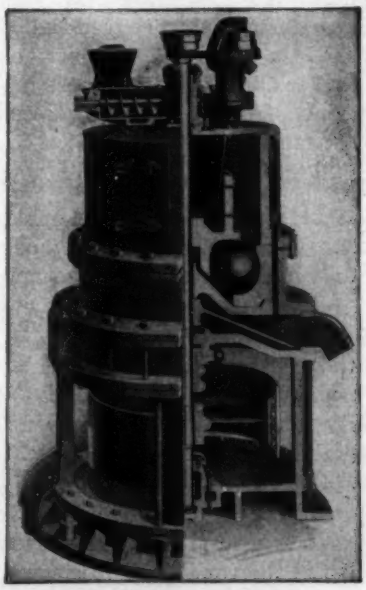


Fig. 3. Coal pulverizer

be stopped, an advantage in case of accident or emergency.

4. With stokers the amount of coal that can be burned per square foot of grate area is limited, so that for increased capacity the boiler setting must be spread out to cover greater area. In using pulverized coal this condition does not exist, for proper furnace conditions can be obtained by increasing the height of boiler setting or depth of combustion chamber.

5. Ash is easily handled. Being in the form of a dust or slag, it is readily removed. This fact makes it easy to maintain constant furnace temperatures, as there is no interference with firing conditions on account of cleaning fires.

6. There is no trouble with clinkering on the grates.

7. Pulverized coal as fired contains less than 1 percent. of moisture, whereas with ordinary methods of firing, coal may contain from 1 to 10 percent. of moisture.

8. Considerably less excess air is required for combustion. This is a point of the greatest importance. In this respect pulverized coal compares with fuel oil. The less excess air we have the smaller volume of mechanical draft required, and the smaller the stack losses.

Fig. 4. Feeder (Lopulco)

Among the disadvantages of pulverized coal are:

1. Cost of preparation.
2. Explosibility of coal dust.
3. Limitations of storage.
4. Depreciation of furnace linings.
5. Discharge of large amounts of refuse through chimney.

Pulverized Fuel Equipment

A pulverizing plant consists of the following principal units: crusher, crushed coal dryer, pulverizer, storage and conveying apparatus, and burners. The size of the plant will determine the number of each of these various units to be employed.

In a typical installation the coal is dumped by gravity into a track hopper, from which it is taken by a belt conveyor to a hopper located above the coal crusher. Magnetic separator pulleys are located between the track hopper and the crusher hopper to remove scrap metal, such as bolts, pick points, etc. After being crushed to about 1 in. in diameter, the

Fig. 5. Pulverized coal burner (Lopulco)

coal drops to an elevator pit, from whence it is taken by the elevator to the dryer storage bin.

The coal dryer is cylindrical in form, being rotated by a small motor, or by a pulley from a line shaft. It is usually heated by hand firing on grates. It must necessarily be of such a size as to deliver the entire quantity of coal, thoroughly dried, for continuous operation of the power plant.

From the dryer the coal again falls into an elevator pit, from whence it is carried to the pulverizer hopper. In this process it is again carried over a magnetic pulley to remove any small pieces of metal which may not have been caught by the first magnet.

By stops and gates the coal is fed to the pulverizer, which grinds it to the required fineness. From the pulverizer the coal is conveyed by screw conveyor or air pressure to the storage bins. The capacity of these bins must be determined with reference to the service required, bearing in mind that provision must be made for periods when the pulverizers may be out of commission.

Crushing Rolls

There are a number of good standard makes of crusher rolls on the market. That illustrated herewith is the Jeffrey (Fig. 1). The rolls are equipped with safety springs, and breaking shells are provided which permit them to separate under excessive strain. The crushing surface consists of segmental toothed or corrugated sections secured to a hexagonal drum, so that broken or worn out sections can be replaced without renewing the entire roll.

Coal Dryer

Fig. 2 illustrates the Fuller-Lehigh indirect firing rotary coal dryer which consists of an axially inclined cylindrical shell fitted with suitable rollers and gearing to permit the shell being rotated on its longitudinal axis. The higher end of the dryer shell terminates in a brick housing which serves to support the stack required to discharge the waste products of combustion of the dryer furnace, and the vapor given off by the moist coal being dried. The lower end of the shell terminates in a steel hood. The furnace for heating the dryer is placed between the stack chamber and the hood. This furnace may be provided with one or two fireplaces, depending upon the size of the dryer. The furnace is provided with a large combustion chamber through which the dryer shell passes. The entire furnace is built of brick and the walls are securely bound together by means of buckstays and tie rods.

The moist coal is fed into the dryer shell through a feed spout located in the stack chamber. This spout enters the dryer shell and delivers the coal close to the bottom of the shell. A series of longitudinal shelves fastened to the inside of the dryer shell lifts the coal and drops it through the current of heated air passing through the inside of the dryer shell. Inasmuch as revolving shell of the dryer is slightly inclined downward toward the discharge end, the coal travels the entire length of the shell and is finally discharged, perfectly dried, from the lower end of the dryer shell.

The hot gases from the furnace fire circulate around the outside of the dryer shell, passing through the combustion chamber of the furnace. They then leave the combustion chamber through the horizontal breeching and enter the top of the hood at the lower end of the dryer. From this hood the hot gases flow to the interior of the dryer shell and come into direct contact with the coal in the dryer shell. After they pass through the interior of the dryer shell the hot gases enter the stack chamber at the upper end of the dryer and then escape to the atmosphere through the stack.

The Pulverizer

Pulverizing mills may be either the ball or the roller type. In the ball type illustrated herewith (Fig. 3), the material to be reduced is fed to the mill from an overhead bin by means of a screw feeder. The feeder is driven from the mill shaft by a belt running on a pair of 3-step cones, thus permitting the operator to regulate the amount of material entering the pulverizer. The pulverizing elements consist of four large steel balls, rolling in a stationary, horizontal concave, grinding ring. Material discharged by the feeder falls between the ball and the grinding ring in a uniform and continuous stream, and is reduced to the required fineness in one operation. Material is drawn through screens and discharged by means of fans.

Feeders, Mixers and Burners

Figures 4 and 5 illustrate the "Lopulco" feeders and burners. The functions and methods of operation will be evident from the illustrations. The essential requirements of pulverized fuel feeders and burners are:

1. Positive control of the fuel feed.
2. No flooding and clogging.
3. Ability to regulate temperature in furnace.
4. Adaptability to various grades of fuel.
5. Control of combustion and length of flame.

In the present paper we have covered pulverized fuel systems in a general way. Next month we will discuss in detail the conditions of the successful use of pulverized coal under boilers, the cost of pulverizing, furnaces for pulverizing fuel, storage of pulverized fuel, and, we will finally examine various tests of powdered coal under boilers, and discuss boiler efficiency with this newer type of fuel.

Motor Operated Gate Valves

THE demand for valves capable of being operated by electric control from one or more remote points, has induced a well known manufacturer of gate valves to make a special study of this method of control to the end that they may in all good faith warrant the perfect operation of any electric control valve of their manufacture.

The necessity of a reliable, efficient and expeditious method of valve control for steam lines, particularly in event of rupture of the main lines, is very evident from a safety standpoint, the old method of direct manual operation being not only a very slow procedure but ofttimes one of great danger. It is not necessary to dilate upon the advantages accrued from

the expeditious control of valves in event of accidents, particularly so, when such control may be effected from a safe distance.

Until the tests conducted by the Public Service Electric Company at Newark, N. J., on January 28, 1922, under the auspices of the National Electric Light Association, great doubt existed as to the possibility of closing a gate valve under the extreme velocity conditions occasioned by a ruptured steam line, but the test proved, beyond the question of a doubt, that a valve properly constructed would effectively operate.

The valve used on the above mentioned test was a 10-inch cast steel, monel mounted gate, equipped with a Dean Electric Control. It successfully closed in less than 30 seconds against a boiler steam pressure of 225 pounds, superheated 150°F. The discharge end of the valve was open to the atmosphere and the steam was permitted to escape for one minute and a half before the valve was closed.

Afterward the seat and disc rings were carefully examined to ascertain the effect of this severe test, when it was found that they were in perfect condition and showed no marks, such as would be occasioned by the disc dragging across the seats in valves wherein the disc is not properly guided.

These motor operated gate valves are precurable in either iron body bronze mounted or cast steel monel mounted patterns in sizes 6" and larger. The disc guides are carefully designed and machined to prevent the discs dragging across the faces of the seat rings and the yoke bushing is provided with a

ball bearing to take the thrust and reduce the power required for operating the valve to a minimum. All valves are equipped with Dean Control and may be ordered with as many separate control stations as desired.

Recovery and Its Control

By G. K. SPENCE

Presented at the Seventh Annual Meeting of the Technical Association of the American Pulp and Paper Industry, on April 11, 1922, at the Waldorf-Astoria Hotel, New York

THERE are different methods for figuring recovery, but all have the same ultimate idea in view, which is to determine the percentage of the original soda used that is recovered and returned to the system.

It is generally customary to consider all soda used in the mill on a 48 per cent Na_2o basis. This custom became prevalent, due to the idea that recovered black ash from the rotary furnace contained 48 per cent Na_2O, while in reality this ash rarely contains over 46 per cent Na_2O. The average Na_2O content is more nearly 45 per cent.

In some mills the recovered black ash is weighed before sending it to the leachers, and the total weight multiplied by the average test gives the total ash recovered in 24 hours. The recovery is determined in this case by adding the amount of fresh 48 per cent soda used in the alkali room to the above total, dividing this new total into the amount of fresh 48 per cent soda used and multiplying by 100.

Regardless of the method used, it is customary to figure recovery from the amount of fresh soda used in the alkali room, without any reference to the change in the amount of soda in circulation in the different departments. This is a mistake, as the recovery figure in this case has no bearing on conditions in the soda mill at that particular time. One wishes to know at the time the cause for a poor recovery, and when handled in the manner above mentioned, the cause may come on one tour and the poor recovery not show up until the next tour, or even a day or two later.

Actual Recovery for Any One Tour

Some years ago the writer instituted, and has since been using the following system, which gives the actual recovery for any one tour, or any one day, if not found convenient to check conditions every tour:

It is more convenient to make the digesters the starting point, due to the fact that the digester liquor is always carefully measured and tested. The number of digesters put on, multiplied by the pounds of 48 per cent soda used in each digester, will give the total soda used on each tour, on each 24-hour run, as the case may be. A recovery inventory report is filled out at the close of each tour, and balanced in order to

show gain or loss in the amount of soda in circulation in the various departments. From this data, the amount of fresh soda used in the alkali room, and the number of digesters put on, the actual recovery can be determined for any one tour or any one day. There are fixed figures for each inch gain or loss in the different liquor tanks, and for full digesters, strong alkali pans, strong wash pans, and full leachers in circulation. The following example, taken from two inventory reports, will better explain the method of procedure:

Recovery Inventory Report

11-7 Tour—March 5, 1922	Gain	Loss
Empty Digesters 1		
No. 1 Digester Tank .....Full		
No. 2 Digester Tank .....59" out		
Digesters Put On 15		
Strong B. S. Pans 3		
B. S. Storage Tank .....6" out		
Yaryan Storage Tank .....8½'		
B. S. Pans Run 14		
Rotary Tank .....29"		
Leachers Full 2		
Strong Alkali Pans 8½		
Caustic Liquor Tanks .....6" out		
Carbonate on Hand .....321"		
Alkali Pans Made 7		
Soda Used 7,700		

Leaks—Digester Pump—Called Pump Repairman.

—Signed.

7-3 Tour—March 6, 1922	Gain	Loss
Empty Digesters 0	4,000	....
No. 1 Digester Tank .....Full	....	....
No. 2 Digester Tank .....49" out	550	....
Digesters Put On 15	....	....
Strong B. S. Pans 2	....	4,000
B. S. Storage Tank .....8" out	....	300
Yaryan Storage Tank .....9'	600	....
B. S. Pans Run 15	....	....
Rotary Tank .....33"	1,680	....
Leachers Full 2	....	....
Strong Alkali Pans 8	....	5,500
Caustic Liquor Tanks .....8" out	....	1,200
Carbonate on Hand .....351"	....	....
	6,830	11,000
		6,830
		4,170

Alkali Pans Made 7
Soda Used 10"x110 Gal. x 1.75 lbs...1,925
Carbonate Liquor Drawn .....40"
Leaks—None.
Actual Soda Lost = 4,170 plus 1,925 = 6,095 lbs.
15 Digesters x 4,000 = 60,000 lbs. soda used.
60,000—6,095 = 53,905 lbs. soda recovered.
Actual recovery = 89.84%.

JOHN DOE, Signed.

So much for the method of figuring actual recovery.

What Becomes of Extra Soda

The question now arises: If the actual recovery is low, what became of the extra soda? In an efficient recovery control system it is not necessary for the man in charge to guess at the answer to this question. He has the proposition so well lined up that he can at once place his finger on the proper point in the recovery department, and arrange to stop the leak or reprimand the party responsible for the loss.

The thoroughness of the check system is dependent upon the class of labor employed in the various departments. In some mills the men are as much interested as the recovery foreman in saving soda in their respective departments. In this case it is not necessary to have the check system so rigid. On the other hand, there are times when the type of labor is so poor that they will cut corners when possible, regardless of the loss of soda by so doing. When one has this class of labor to deal with, it is advisable, wherever possible, to sew up the different departments in order to prevent strong liquor from being carelessly turned to the sewer.

Most Exposed Departments

The departments more exposed to chances for excessive waste are the brown stock wash pans and the alkali room. The writer has known of cases where a digester has been dumped into a wash pan and almost completely drained before it was discovered that the valve was opened to the creek instead of the strong liquor tank for the evaporators. Also of cases in the alkali room where a large quantity of carbonate liquor has been pumped to the creek before the discovery was made that the plug had not been placed in the wash-out line of the alkali pan before the leacher pump was started. These are cases of gross carelessness, due to conditions mentioned above, where the labor is not dependable. Excessive losses due to inefficient labor can be prevented in the brown stock department by introducing a cycle washing system and having no line that can be opened to the creek. In this case all washings either go to next succeeding pan or liquor storage tank for the evaporators. Large losses due to carelessness in the alkali room can be avoided by having the wash-out lines from the alkali pans connect with a pump to a filter press, all sludges washed on the press, and the washings returned to the alkali room for making up strong pans and first washes in this department.

Some form of filter press is in use in a number of soda pulp mills today, and the recovery in this department has been considerably improved by its addition.

We all know that the principle of recovering soda from spent liquor is theoretically perfect, but owing to leaks in the different departments, the best recovery obtained in the present day is 91 per cent, while the recovery in most mills falls considerably under this figure.

The secret of good recovery can be summed up in a few words—"Watch the leaks and do not allow soda to get away."

An Efficient Control System

The writer has found that the most efficient recovery results can be obtained by installing the following control system:

Place a boy on each tour, not necessarily a chemist, but a dependable high school boy, who can figure and learn to make certain routine tests. His duties are:

1. (a) If a filter press is in use, to test an average sample of lime cake from all presses dumped for soda

content, and from the number of pans pumped and pounds of calcium carbonate in each pan, the loss of soda at this point can be readily calculated. (b) If filter press is not in use, to measure and test sample of each sludge washed to the sewer, in order to determine loss of soda in this department.

2. To check Beaumé and causticity tests of the digester liquor.

3. To test a sample of liquor from each wash pan when it is turned to the creek in order to check loss of soda in this department.

4. To check temperature and Beaumé tests of the weak and strong liquor at the evaporators. This record will give a check on the manner in which the stock was washed, and uniformity of the strong liquor sent to the evaporators.

5. To test water from condenser pumps of the evaporators from time to time to determine if any soda is being pulled over.

6. To test all leacher dumps in order to determine loss of soda at this point.

7. To follow all lines, pans, pumps, etc., for leaks, when possible to fix them, or if necessary call out the proper repairman to do so.

8. To take an inventory of all soda in circulation at the close of each tour, and make out a report similar to ones shown in forms above.

What Efficient System Should Include

An efficient recovery system will include a venturimeter to measure all liquor pumped from the wash pans to the evaporators, which, when supplemented with an average test of the liquor, will give the pounds of soda delivered from the wash pans to the evaporators.

It is also advisable to make occasional tests of the rotary flue gas to determine the loss of soda up the stack. This latter test has been fully described by the writer in a paper presented to the Technical Association and published in Paper, February 12, 1919.

If a system similar to the one above described is employed by every soda pulp manufacturer, there will be no reason whatever for a poor recovery, as he will then be in a position to tell where the leaks occur and remedy the condition at once, whether it be due to carelessness of the employees, or the necessity of increasing the equipment in any department.

Groundwood and Waste Paper in the Manufacture of Paper

By E. ARNOULD

Translated from "Le Papier," XXIV, 48, (February, 1921)
By A. PAPINEAU-COUTURE

DURING the last 20 years or so, the tremendous increase in the consumption of paper has resulted in a corresponding increase in the consumption of groundwood and of waste paper, which fact, in conjunction with the cost of labor and the strong competition which existed, led to a gradual change in the methods of treating these materials and in the equipment for working them. In consequence of all this new pulpers were designed and put on the market which had a larger output than their predecessors. For this reason, and for this reason alone, they came into favor, as the paper makers considered production only and did not pay any attention to the quality of the product turned out by the machines.

But it stands to reason that all stock should not be treated the same; and whereas in certain cases output per 24 hours is the main consideration, in other cases great stress should be laid on the quality of the work done by the pulpers so as to obtain the required grade of finished paper. Unfortunately a considerable number of paper makers are hardly in a position to appreciate such fundamental principles when it comes to a matter of making alterations and additions to their existing equipment. But the question is not quite as simple as might appear at first sight, for there are cases where both the output of the pulper and the quality of its product are of great importance. There are, besides groundwood, all the various kinds of bleached and unbleached wood pulps, which it may be advisable to pulp and wash, and sometimes bleach, before sending it to the beaters. This comprises the following operations:

1) Pulping of the sheets or rolls of chemical pulp;
2) Washing with pure water;
3) Bleaching with chlorine;
4) Final washing;
5) Dumping into the drainers.

There are at present no machines which can pulp dried sheet pulp properly and rapidly without numerous handlings; or at least such machines are not among the regularly stocked equipment.

In some mills, the sheets of pulp are passed through special shredders which tear them to pieces; in others horizontal groundwood shredders are used, from which the pulp comes in the form of round pieces about the size of a 25c coin; while in others ordinary kollergangs are used, but not without trouble, if, as

often happens, the pulp contains a considerable amount of pitch. As to the use of the old-fashioned washing and beating engine equipped with a drum with inclined blades to circulate the pulp, it causes a considerable loss of time without giving the desired results.

There exists a piece of apparatus, which has the double advantage of being simple and of working rapidly, which can pulp dried sheet pulp almost instantly and automatically without additional cost. It has been patented as a combined shredding, washing, and bleaching beater (Fr. patent No. 499,318, delivered to Le Nord Africain Co., November 15, 1919). We have had occasion to install one of these beaters in a large paper mill, where it has given and is still giving entire satisfaction. It has even shown that cotton pulps (for blotting paper) and also esparto and straw pulps can be rebleached without the almost inevitable formation of lumps on the paper machine, a point which is not without importance. In passing we may note that the old style propelling drum can be readily converted into a shredding drum at no great cost.

The working up of groundwood can be considered from two entirely different points of view, according as it is to be used for board or low grade papers, or for fine or semi-fine grades.

For the manufacture of common papers, the main thing is to be able to incorporate as much groundwood as possible into the paper and have a large output. It is essential that the capacity of the pulping equipment be sufficiently large to insure against a stopping of the paper machines for want of stock. The use of conveyors for carrying the pulp from the pulpers to the beaters results in a saving of precious time, and also of labor. In the manufacture of this grade of paper, the degrees of fineness of the groundwood is of no importance, while the cleanliness of the stock is a secondary consideration. What is required above all else is a large production, so as to cut down the cost of production as low as possible. Of course, large capacity pulpers, such as the Schreder, the Dietrich, the Wurster, the Lannoye, etc., are well suited to this class of work, although they knead rather than crush the stock. Edge-runners with ovoid troughs are also quite popular on account of their large capacity, though they do not crush the stock at all but shred it by kneading and rubbing it up, without removing any of the shives. This is due to the fact that water must be added until the mixture contains about 80% of water and 20% of pulp so as to prevent the material from being forced out of the trough, and at this dilution the stock cannot remain under the runner, which rests entirely on the bottom of the trough and cannot, therefore, exert any crushing action. The same thing happens when waste papers are being worked up; but in this case it does not matter as the material has already been repeatedly triturated. Hence, the use of these various pulpers for the manufacture of the lower-grade papers is perfectly logical and well adapted to the results required.

But when we come to consider the manufacture of medium-grade and semi-fine papers, such as book, writing, coated, cover, wall papers, etc., the whole question takes on an entirely different aspect; for here it is very important that the paper should have a finer grain, that the surface be regular and uniform, that its formation, color, and general appearance come up to a certain standard. It must not be forgotten that the art of making these grades of paper with a certain amount of groundwood consists in incorporating the latter in such a manner that it cannot be detected with the naked eye. A paper containing 15 to 20% of improperly worked groundwood is quite rough and coarse before calendering; but as soon as it has been calendered all the shives show up plainly, especially when the sheet is held up to the light.

It is thus seen that the object of adding groundwood depends entirely on the nature and grade of the paper. On the one hand it is present in large quantities and is one of the natural constituents of the paper; on the other, it is added only in small amounts so as to reduce the cost of production, make up for the excessive transparency of papers made entirely from chemical pulps, and help to give the sheet the softness, opacity, and bulk required for printing and demanded by usage.

The paper manufacturer must therefore exercise judgment in the choice and installation of his pulpers, kollergangs, and shredders. This is perhaps not quite so important for those manufacturers who make their own groundwood, as they have a chance of adjusting it to the proper degree of fineness in the course of its preparation. But they are the exception, as most paper manufacturers (in France-Trans.) buy their groundwood, and it must be worked up perfectly to eliminate all the shives, lumps, bundles of fibers, and other impurities. On this condition (and on this condition only) mechanical pulps can be very useful in the manufacture of semi-fine papers, where they act as fillers and correct the excessive hardness and transparency of the stronger pulps.

Up till now there has been constructed but one machine suited to the preparation of mechanical pulp for the manufacture of fine papers. It is an edge runner equipped with scrapers for bringing the pulp (containing only 25% moisture) into the middle of the trough, so that it is really crushed between the runners and the trough. The output is barely half that of the usual type of edge runner, and it is also more difficult to run properly; but it works the stock up exactly in the manner required and does not injure the fibers, which are two of the defects of the ordinary forms of kollergangs.

It should not be forgotten that paper making is not merely an empirical art: it is a science, both theoretically and practically. Each process, the

method of working of each piece of machinery, is governed by scientific principles, which are familiar to those who have made a special study of these problems.

Description of Beater

In connection with this article we thought it would

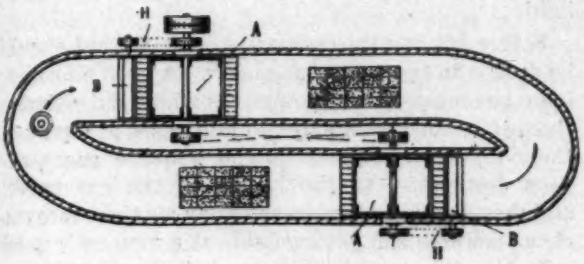


Figure 1

be interesting to give an idea of the beater referred to.

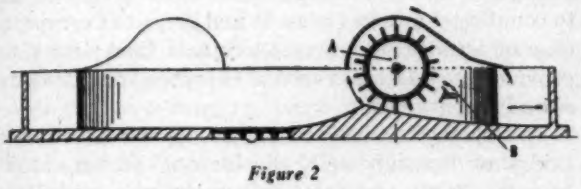


Figure 2

The patent covers certain improvements in the construction of the rolls of engines used for washing and bleaching paper pulps, by means of which ordinary washers, which had been used only to wash and bleach rag pulps, are converted in shredding beaters, which can pulp very rapidly dry pulp in sheets, previous to bleaching or rebleachng. In the accompanying diagram Figure 1 is a plan, Figure 2 a vertical side section, and Figure 3 an end view in part section.

The beater is equipped with two large paddle wheels A similar to those previously used. Each of

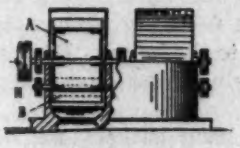


Figure 3

these two large rolls works in conjunction with a small roll B, placed in front of it. The small roll may be driven by any suitable means, for instance, by means of belting or gearing from the shaft of the larger roll.

The action of the small roll trebles the shredding effect of the large roll, so that it is admirably suited for pulping sheet pulp. At the same time, its powerful beating action renders it pre-eminently suited for bleaching cotton pulp for blotting papers, esparto pulp, and chemical straw pulps. These special grades of pulp, which in the old type beaters used to form into lumps similar to rice grains, are entirely free from this defect when worked in the new beater.

Accident Prevention in the Sulphite Mill

By F. H. ROSEBUSH

Dept. Industrial Relations and Safety, Nekoosa-Edwards Paper Co.

IN theory one would naturally suppose that in a sulphite mill, the dangerous places would be found around the digesters, in the acid plant, and wood room.

It is the intention of this article to point out some of the danger points and how to guard them and then to give a short summary of accidents actually happening in a sulphite mill, in order to show where the emphasis on safety work might be placed to prevent them.

Inasmuch as the natural trend of the raw material first enters the wood room let us start there.

A pamphlet published by the Wisconsin Industrial Commission, Volume VII. No. 1, states that saws are probably the most dangerous machines used in wood working. This naturally leads one to conclude that in the wood room the saw should be most carefully scrutinized as to its installation and guard. Because a circular saw is the most dangerous of any, the saw should be so installed that neither the sawyer, tail sawyer, nor man pulling blocks away from the saw, if there be one, should be in line with the saw. Out of 660 accidents, in Wisconsin, on saws in 1920, according to the report of the Wisconsin Industrial Commission, 421 were on circular saws. Many of these accidents, of course, were to hands, fingers, or arms, and in the sulphite wood room such accidents should be reduced to a minimum as the material is not hand fed. Many accidents are due to the removal of guards and working without them; failure to use pickaroon or pike hole, in place of hands; wood becoming pinched and causing saw either to break or flying pieces of wood. The saw or saws, if one be superimposed above the other, should have heavy guards both in front and back to prevent wood flying. In addition to this some mills place a smaller wire guard directly in front of the face of the sawyer to prevent flying chips. This can be so constructed, by being small enough, so that the sawyer can get protection and at the same time not be hampered in looking around or under the guard.

In mills where drum barkers are used, there should

be care given that their installation is such as to offer best conditions to workmen making repairs. As the chains and drives are generally operated from above, suitable platforms or floors should be provided to prevent falling, slipping, or dropping of tools or chains on workmen below. Care must be taken that no one can fall into the drum as there is little chance of rescue when once caught. In cases where disc or knife barkers are used, there are now on the market automatic rotary feeders which do away with the necessity of having the operator's fingers so close to the knives. One danger from hand barkers is of flying chips to persons passing or working near.

In cases of hand barkers one of the best safe guards is in the selection of the kind of operator to handle this type of machine.

Chipper accidents generally are from flying chips. These can be avoided somewhat by locating chippers below the floor, if possible, or with extra long chipper throat or the placing of screens in front of chipperman. Some chipper throats can be equipped with doors hung from the top like the old-time cat or dog door found at the bottom of barn doors.

Mechanical guards in the wood room have of late become so perfected that the stress, we believe, must be rather placed on educating the workman to protect himself. The record of accidents in our mill runs somewhat as follows: caught finger between block and bumper, unloading wood, foot slipped, finger caught between log and bumper, cleaning up in basement, put his finger in gears, cutting wire on log cars, piece of wire hit eye, etc., etc.

A very vital part of the safety work in the wood room as elsewhere, is the attention given to the proper selection of men and their allocation. Some jobs require young men such as unloading logs, running big splitter, handling wood around saw carriage and feeding chippers. Older men may be safely used along conveyors, sorting of wood, oiling, and cleaning up.

It is a very good plan to have men working in the wood room wear extra heavy boxed toed shoes as these will often prevent painful injuries from falling blocks.

In the sulphite department in general one of the most important matters is the safeguarding against gases. Many men take pride in boasting of how much gas they can "eat" and get away with it. Authorities differ as to the extent diseases caused by sulphite mill gases, but all are agreed that they are more or less dangerous. Cases have been known when men with weak lungs have been seriously affected by these gases and they have even caused digestive disturbances. Great care should be given to the proper installation of piping, blow tanks, relief lines, and joints. In the furnace room gas is nearly always noticeable. This is extremely dangerous if found in any large quantity. Attention should be given to the proper ventilation of these furnace rooms, in many cases resort must be had to mechanical means.

In the acid tower system care should be given to elevators. They should be well screened, the platform protected at top with necessary railings and toe boards and proper amount of ventilation and light.

Before leaving this subject of gas, a word should be spoken in regard to gas masks. A good plan is to issue gas masks to the employees whose duties bring them in contact with sulphite mill gases as a part of their regular equipment. The sulphite gases are very destructive to the rubber in the gas masks and they should be kept in as nearly air tight receptacle as possible and yet available at a moment's need.

In the digester building, we believe three things are vitally necessary: light, ventilations and proper amount of exits. Light because it is essential to examination of valves, piping, gauges, acid measuring glass, and footing; ventilation to allow plenty of air to counteract any gas present and permit of escape in case of bursting pipes or leaky acid lines; exits, to provide ready and easy means of escape from dangers already mentioned.

The blow-off valves should be operated from the bridge or through wall; the blow-off piping should be extra heavy and some follow the plan of drilling small holes in the under side of first length of blow-off pipe beyond the blow-off valve so that these will indicate when the walls have been worn thin by friction of stock and action of acid.

It is well to have the floors slant either to a drain under the digester or to outside to prevent wet floors. Speed here is oftentimes a life saver. The linings of the digester should be examined regularly and reported to the superintendents and foremen by permanent record. It is a decided necessity to have a reversible fan provided for digesters which will either blow fresh air into digesters when under inspection or repairs or suck out gases.

Ropes or other life belt arrangements ought to be located in chip bin for safety of workmen entering to dislodge chips. After steam has been turned to digester, the blow-off valves cover should be left open to allow leaking acid to escape to floor and unless positively necessary no attempt should be made to tighten or molest this valve until ready for the blow-off as such a molestation of valve may cause disaster. This also holds true of the head cover.

In the preparation of the stock after it has left the digester, attention should be paid to condition of floors in screen and washing room. Many accidents occur from slipping and striking against objects or falling. Cement curbs of suitable heights provide excellent dams against wet floors and with proper drainage this danger to which many accidents are chargeable can be avoided. Guards around the screens and wet machines should be built with

special attention to prevent hands or fingers being caught in gears or belts by workmen trying to catch themselves from falling or by slipping.

In the bleach department, aside from the hazards of machinery, the chief danger lies in handling and mixing of bleach. One good way to prevent the obnoxious odors and gases is to have the mixing tank enclosed with double doors in front to allow easy and free access to tank. After the drum has been elevated by hoist over the tank these doors can be closed and the drum dumped by chain or rope. Mechanical fans help to take off the gases thus making the task much less disagreeable and dangerous.

The use of respirators may help some, but workmen do not like them in warm weather especially and they are rather inconvenient at all times. The point made in connection with the digesters as to ventilation could likewise well be applied to the bleach plant.

It is well to have the bleaching department so constructed that the free use of water on floors for cleaning purposes is available.

In conclusion let it be said that not all danger points have been covered in this article, not all remedies mentioned but the well known slogan, "The Best Safety Device Known is a Careful man," is coming to be the keystone of safety work. The greatest number of accident in the mills of which we have knowledge comes from the man who is not careful, and as stated before it seems that we have reached the point when individual education for safety will bring the greatest results.

Depreciating the Valuation of Patents

By RALPH H. BUTZ

THE PROBLEM of making proper provision for the depreciation in the value of patents is one that confronts a large number of manufacturers. This depreciation in value occurs very rapidly in some instances, while in other cases it may take place very slowly. In view of these conditions it must readily be admitted that to estimate the life of a patent at the time of its acquirement is a difficult problem. And yet, it is a problem that should be solved by every manufacturer who has no desire to write this asset into his balance sheet at an inflated or fictitious value.

There is no doubt that a patent is a valuable asset as long as it has not become obsolete. In fact, it may be easier to establish the real value of patents than the theoretical value of good will. However, a patent may be carried on the books at a valuation far in excess of its actual worth, owing to the fact that no provision has been made to charge depreciation during those years when the depreciation occurred. The danger of such a policy is readily realized when it is known that the book value of such a patent must be charged to profit and loss in one amount after it has outlived its usefulness.

It is a far better method to extinguish the book value of a patent in ten annual installments than to charge the entire amount to profit and loss at the end of ten years, thereby reducing the profit for the tenth year to a great extent.

While it is true that some patents have considerable value after their legal life has expired, such cases must be considered as exceptional and contingent upon certain events or circumstances. A great number of patents are of very little value after the tenth year, and the manufacturer who refuses to recognize this possibility can not be considered as being sufficiently conservative in this respect.

As a rule the depreciation of patent values occurs most rapidly during the first years of its existence, and during which years the greatest profit is derived from its application or use. This fact should be borne in mind when the schedule of depreciation charges is being constructed.

One manufacturer, who is very conservative, maintains a schedule of depreciation charges by which the book value of his patents is extinguished at the end of five years. This schedule should prove to be of interest to other manufacturers who are making efforts to arrange their schedule for this purpose on a sound basis, and for this reason the figures are given herewith:

First year—30%; Second year—25%; Third year—20%; Fourth year—15%; Fifth year—10%.

These percentages apply to the original value, not to the diminishing balance, and by this process the original value is completely extinguished at the end of the fifth year. Of course, this is a very conservative policy, for some of his patents may be considered as having depreciated not more than 50% during the five-year period. However, his gross profits are of such volume that this expense is absorbed without any undesirable effects.

Three years ago a manufacturer purchased a patent at a cost of $50,000. He estimated the useful life of this patent to cover a period of not more than four years, due to the rapid development of this class of appliances. He finally decided to write down the valuation of this patent on a royalty basis, and added to the cost of production one dollar for each article manufactured. At the end of two years the original cost of the patent had been absorbed in the production cost, and without reducing his net profit over that of former periods. This patent has not yet be-

come obsolete, but he adopted a sound policy in this respect.

What are proper charges to the Patents Account? The first charge is the purchase price of the patent. Unless there are very good reasons to the contrary, the Patents Account should not be charged with a greater value than the actual purchase price. That manufacturers sometimes increase the book value of their patents over the purchase price was demonstrated recently when the assets of a certain firm were carefully examined by professional accountants. In this instance it was found that the purchase price of patents on record amounted to $22,000. These were carried on the books at a valuation of $97,000, and the annual depreciation charge amounted to only five per cent of the book value.

The cost of litigation to protect patents is also a proper charge to the Patents Account, although such expenditures are frequently charged to Legal Expense, to which there is no objection.

Expenditures for the purpose of procuring assignments and shop rights for the use of patents are also proper charges to the Patents Account.

The most commendable way to allow for depreciation is to build up a reserve for this purpose. In this manner the full purchase price of the patent may be carried on the Patents Account until its useful or legal life has expired, and then the entire amount can be charged to a reserve established for this purpose. Such a reserve is established in the same manner as reserves for plant, buildings, machinery, etc. In this manner the asset accounts and the liability accounts will be reduced in like amount.

Pointers for the Engineer

By W. F. SCHAPHORST, M. E.

Incorrect Gasket Size

MANUFACTURERS of square lapped Van Stone joints go to considerable trouble and expense making square laps. It is much easier to make the corner rounded as was first done years ago. Manufacturers of gaskets are aware of this, yet the writer knows of instances where these manufacturers instruct users to place them as indicated in the sketch, Fig. 1. This is wrong because it leaves the gap AB. This gap should be entirely filled in. By leaving the gap AB, the purpose of the square lapped joint is defeated. Eddy currents will be established and the friction of the pipe of course will be increased.

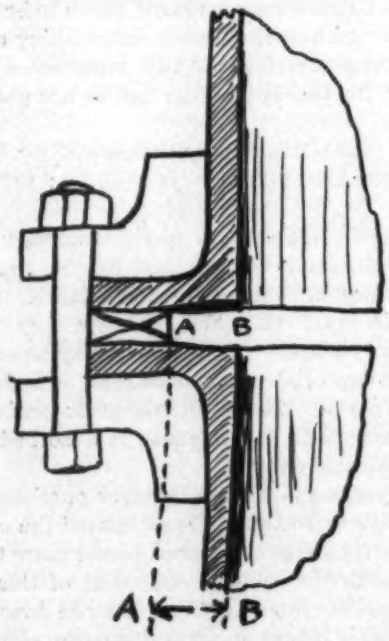


Figure 1

Either the width of the gasket should be great enough to fill the entire space from the bolt to the inner edge of the pipe, or it should be of the same or some intermediate width with an internal diameter equal to the internal diameter of the pipe. The object in squaring the corners in the Van Stone joint is to make the interior of the pipe so smooth that fluid friction is not increased by the joint. Any roughness or irregularity at the joints is bound to cause additional friction.

Which Is Best?

WE are told that it "always pays to buy the best." This is one of the few old proverbs that have not been refuted and I believe this one will never be disproved. It is too "slippery" to be disproved.

The question is, what is meant by BEST? Does BEST mean MOST EXPENSIVE? No. A crow bar made of gold, for example, would be less practical than one made of steel. For structural purposes or for machine tools, gold is entirely too soft. Steel usually is best, although it costs much less.

When you buy food, you don't necessarily buy the most expensive. You buy what you believe to be best. Rich, expensive food is not always the best.

When you buy clothes, you follow similar tactics. You pay $20, $30, or $40 for a suit of clothes. It all depends on where and how you expect to use the suit. There are many factors that enter into the purchase of clothes. We should always aim to buy the

suit or the clothes that are best for us. The fellow who pays three or four times as much or who can afford to pay three or four times as much should aim to select the suit that is best for him. Best is a flexible word depending upon the buyer as well as upon other conditions.

Closed Arches in Boiler Rooms

THE writer was amused not long ago in observing a photograph of the outside of a boiler room. The walls of this boiler room were so built that part of the brickwork could be knocked out leaving two arches through which to remove or insert the two boilers. The author wrote regarding these arches as follows:

"The big arch is 14-ft., 6-in., and the small one 8-ft. wide. The former is large enough to permit the passage of two 72-in.x18 ft. boilers, while the latter will accommodate one boiler of the same size. Three 150-h.p. boilers of the size mentioned are used in the power plant."

Since seeing the photograph, I have been wondering why one of the arches is large and the other one small. Why are there two arches? I am reminded of the proud owner of a dog and a cat who was showing his home to a visitor. In passing a wooden fence the visitor espied two holes through the fence at the bottom. He inquired, "What are the two holes for, Jim?" "For my dog and cat," explained the possessor of the animals. "The large one is for the dog and the small one is for the cat."

Removing Scale from Inaccessible Tubes or Coils

PAPER mill engineers will differ on the subject, but there is no question in the writer's mind that the best way to remove scale from boiler tubes or other tubes is to do it mechanically rather than by use of compounds. Wherever possible I always recommend a mechanical cleaner.

There are some places, however, as in cooling or heating coils, where scale is sometimes precipitated which cannot be reached or cleaned out mechanically. The writer has investigated this matter to a considerable extent in an effort to find a good mechanical cleaner for this purpose but has failed. There is one interesting compound on the market which is a powder and is not chemical. This powder is added to the water and is claimed to be absolutely harmless to metal. It is something comparatively new on the market, however, and the manufacturer informs me that they have never had experience with it in treating scale in coils, consequently they will not guarantee it for that purpose. This powder, it is said, acts "mechanically" and requires more time while acting on the scale than does a chemical compound.

To my way of thinking, the best method for removing scale from inaccessible coils is to send a sample of the water which passes through the coils to a reliable boiler compound manufacturer. These people will analyze the water, and will recommend a certain solution that can be put into the coils, and which will remove the scale. It is stated by one manufacturer with whom I spoke that a single treatment of about three hours duration is usually sufficient to remove ordinary thickness of scale. These manufacturers generally admit that the acid in the compound is harmful to the metal if there is no scale in the tube, but if properly used, when the coils are scaled, there is no danger whatever.

This same matter has been taken up with manufacturers of water purifying apparatus, and they inform me that the weak acid method is about the only method that can be successfully used under the conditions mentioned.

If any reader knows of a mechanical method or better method of removing scale from inaccessible tubes or coils the writer will be glad to know about it.

Only a Faulty Plug

AFTER all that has been said and written about "doing things right in the first place," even in paper mills, present-day results are often very discouraging.

Surely every engineer and workman knows by this time that slipshodness seldom if ever pays. Yet, despite all of our engineering wisdom gathered through over a hundred years of lock-the-barn-after-the-horse-is-stolen experiences, we still go blindly ahead, so many of us, and insist on "taking chances."

If there is anything that can be considered inexpensive these days, an ordinary cast iron threaded plug is certainly inexpensive—so much so that we can almost call a plug "cheap."

Why, then, should a faulty plug be used in an important place? Why use it anywhere at all? As a paperweight a faulty plug might be all right, but for stopping a leak why use a plug that is obviously imperfect—so imperfect that it MIGHT leak? Why even TRY to find out whether or not it will leak? Why, when plugs are so cheap?

I am making this big hullabaloo about a measly little plug because the following actually happened. A manufacturer, mind you—not a regular pipe fitter—put a one-inch plug in the bottom of a boiler. The fellow who did the act evidently SAW the defect because he smeared an extraordinary amount of litharge on the plug, doubtless thinking that the litharge would stop any possible tendency to leak.

The workman was right—for a while. During the test run, and for a week after the test run, the litharge held perfectly. But, after the first week, it started to leak and gradually grew worse and worse. It became so bad in a short time that the boiler had to be shut down and emptied, the water being transferred to a water tank in the meantime, which was an

expense. The water was saved because it was pure and uncontaminated, having been distilled several times.

The cost of the shut down would probably amount to $50 plus the time of the engineer and his helper, plus the cost of writing letters about it, plus the loss of manufactured products for the day, and plus any other little items too numerous to mention. Altogether I am sure that $100 would hardly cover the entire loss due to that defective little 10-cent plug. After removing the plug, it was found that it was very poorly threaded—two circumferences of the thread being totally absent and it MUST have been noticed by the workman. Yet, he used it. Why?

Our Body Structure Is Lubricated

NOBODY will deny that the human knee is a wonderful piece of mechanism. It represents Dame Nature's best effort at making a ball and socket joint. In fact, it is understood by the writer that our knee structure gave the inventor of the ball and socket joint his idea. But it is doubtful if anybody will ever invent a joint that is so perfectly dust and dirt proof, so perfectly self-lubricating, so immune to wear and rust and so ready to do service. And the same is true of all human and animal joints.

Friction and heat are generated at every joint whenever there is motion, just as in a machine made of metal. Mother Nature couldn't "get around it." She doubtless tried but found it impossible. I believe she wished she could have used ball bearings and thought it over with much care, but had to give up.

We power plant and mechanical men are up against the same difficulty—friction. We "almost get around it" in ball bearings and in pivot bearings such as used on balances, but not entirely. In some ways we can "beat Nature" in our designs, but in most ways Dame Nature goes us one better. Whatever we do, though, we must always give Nature her way. Friction is a natural inheritance.

Van Stoning Wrought Iron Pipe

IN conversation with a piping engineer not long ago, the topic turned to wrought iron pipe versus steel pipe for Van Stoning.

"You'd be surprised" said the pipe expert "at the number of special requests we get to Van Stone wrought iron pipe. We have done it, but you should see the sunflower effect produced. On account of the fibrous nature of wrought iron pipe, it invariably splits up into ribbons regardless of the working temperature."

He showed me the end of a wrought iron pipe that had been flanged. The sketch herewith, Fig. 2, indicates what the finished job looked like.

For one customer whose motto was "never say die," the expert had the V-gaps between the "petals of the sunflower" welded solid by the oxy-acetylene torch, and thus did the customer get a Van Stone Wrought Iron Pipe. But—the job was expensive.

If wrought iron pipe MUST be had, the best way is to weld on steel tips and then Van Stone the steel

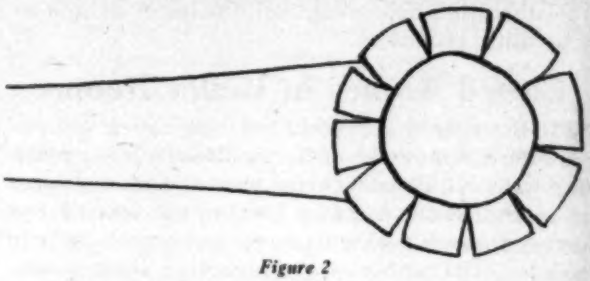


Figure 2

tips, but in general, wrought iron pipe has little if any advantage over steel pipe and the additional cost of tipping is questionable. My advice is—don't insist on Van Stone flanges in wrought iron pipe. Such flanges are very expensive and not so good as steel.

Welded Pressure Containers

PAPER mill engineers and officials doubtless know that welding is being used more and more in preference to riveting.

Riveting will probably never be entirely supplanted, because for certain uses it is more dependable than either electric or gas welding. However, gas and electric welding have already advanced so far that in actual tests on large hammer lap welded pipe with gas welded ends the experimenters state: "The nature of the fractures show that the weak points in the containers were, first, **the lap weld in the pipe forming the shell,** where failure occurred due to circumferential tension, and second, the body of the shell at its junction with the head flange."

Tests were also made on riveted containers with reference to which the experimenters say: "In the case of the riveted containers, **leakage occurred at the head joints under moderate pressures;** in the case of electricity welded containers **there was no leakage at the head joint under any pressure."**

To be sure, before ordering an electric or gas welded container it is well to be cautious. Be sure that the thickness of the metal is great enough. Be sure that the welders are experienced, reliable and willing to be responsible. It is true that there is a so-called "personal equation" in electric and gas welding, but so is there in riveting where riveting is not done by reliable and skilled men. One reason why there have been welding failures is that welding has been regarded "So simple that anybody can do it." The welding of pressure containers is too serious a matter to be placed in unskilled hands.

As evidence that welding is very good and reliable, when properly done, the above experimenters state "no one of the specimens were markedly weaker than the average for the lot. It is believed that the

uniformity of strength thus indicated is of special interest and importance."

Queer Ideas About Light

A GREAT many apparently successful business men seem to have peculiar notions about efficient lighting methods. This I have noticed from time to time in journeying about from town to city and calling upon various firms. Perhaps you have noticed, but never thought about the poor lighting men sometimes provide themselves and their employees as well. I have found, for instance, that it is very common for an employer to use a single little dest lamp of insufficient power for lighting his work. The lamp is usually cheap in appearance and price. Cheapness often seems to be a part of some men's efficiency ideas, and so they call an expensive lamp a luxury and out of place in the business office. The clerks and assistants are compelled to work under the same conditions, and thereby a considerable saving is made in the matter of first cost of lamps.

Very often these "higher up" men work under their poor lights from eight to ten hours per day, and their eyes are tired. Yet, as soon as they get home they insist on entirely different lighting. At home they want the best. Reading the paper at night, they complain at the merest shadow. They are surrounded with the best that can be had, but with tired overworked eyes, they cannot make full and comfortable use of the good light, so simply sit around, smoke, talk, and retire early. These men use their "good" lamps about two or three hours per day and their "poor" lights from eight to ten hours per day and often more. The lesson is obvious.

Tightening Belts, "Steve" Says, Is Like Lifting Yourself by Your Boot Straps

BELT users all over the world are familiar with "Steve," the character who has been dressing belts for 33 years in the trade mark of a prominent belt dressing manufacturer, reproduced here in Fig. No. 1.

During the past 33 years "Steve" has been perfectly quiet—has been absolutely mum—has said nothing. Recently, however, he has come out of his trade mark and is now relating his experiences to the belting and engineering world.

In one of his recent speeches "Steve" said: "I find that regardless of where I go my arch enemy—belt slip—is there ahead of me. It has been my pleasant and successful duty, during these 33 years, to banish belt slip. I know exactly how to do it. Although belt slip seems like a very small and simple thing to make a big fuss about, it is your one greatest enemy. Belt slip is very costly—surprisingly costly."

Has it ever been brought to your attention that 5 per cent belt slip represents 5 per cent of your annual fuel cost? Do you know that if your average belt slip is 5 per cent and your annual power cost is $10,000 you are losing $10,000×.05 or $500 due entirely to belt slip? Do you know that very important yet easily computed fact?

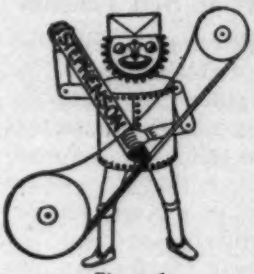


Figure 1

In many factories where power is relayed from drive to drive three, four, or more times, I often find the total belt slip to be as high as 15 per cent. True, the belts may run along nicely. They may look all right. They don't make any noise. The belt man is pretty well satisfied. But, on counting the r.p.m. of the last driven pulley and the r.p.m. of the driving pulley and calculating the r.p.m. that the last driven pulley should make, the belt man is invariably astounded—if the belt is not properly dressed.

If the slip of your main drive is, say, 3 per cent,

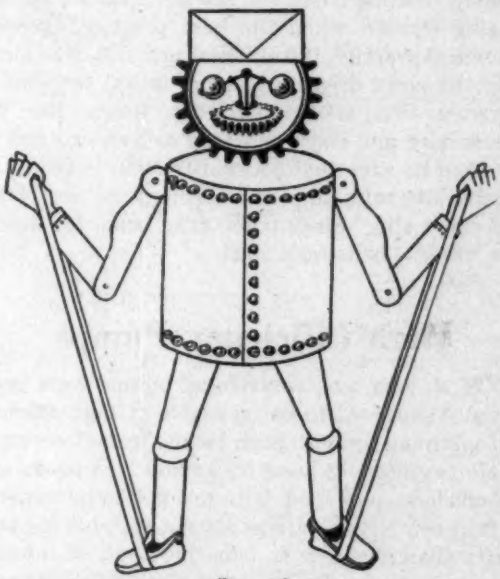


Figure 2

and of your final drive 15 per cent, you have a total average slip of $\frac{15+3}{2} = 9$ per cent, which amounts to $900 per year.

Fellow belt men, I know very well what I am talking about. I claim that I, Steve Stephenson, have dressed more belts than anybody else in the world. I admit that I am famous as a belt dresser. Doesn't it seem perfectly reasonable that a few cents' worth of the right kind of belt dressing which immediately stops slip, would be the most important investment

that a belt man can make? Not only does it seem so—it is so.

What Steve Says About High Belt Tension

Belt users think that by tightening up belts they stop slip. They make them so tight sometimes that the belts almost break without pulling any load at all. It is true that a little tightening may help somewhat sometimes, but it isn't the right thing to do. For example, you know, or should know, that if you have an initial tension of 100 pounds on a given belt, you create a definite amount of friction to overcome. The over-coming of that friction will require, say, one horsepower.

Now, if you double the initial tension by increasing it to 200 pounds you actually double the friction horsepower. In other words, the bearing or journal friction that must be overcome is directly proportional to the tension in the belt. By increasing tensions you therefore don't get anywhere at all. You simply pile a bigger load on your belt without gaining anything. It's like trying to lift yourself by your boot straps. Don't do it. Don't try it. It's poor practice.

Fellow belt men, can you see any logic at all in increasing tension when the best practice, the most economical practice, the quickest practice, is to simply apply the right dressing? High initial tensions are all wrong. You shouldn't tolerate them. Run your belts as nice and slack and easy as you can and you may then be sure that journal friction is reduced to the absolute minimum and if the belts are treated they won't slip. Slack belts, easy belts, low tension belts, slipless belts, are ideal.

High Efficiency Pumps

NOT so long ago, centrifugal pumps were generally supposed to be incapable of high efficiency or of pumping against high heads, in fact several of the old engineering hand books and text books state that efficiencies of over 50% are not to be expected, and that centrifugal pumps are not suitable for heads greater than about 40 ft. As the result of intensive mathematical and experimental work during the past ten to fifteen years, great progress has been made in the design of centrifugal pumps, and large centrifugal pumps have shown efficiencies in excess of 85% when pumping against pressures of 200 to 300 ft.

The absence from the centrifugal pump of valves, rubbing surfaces, and packings renders it ideal for handling liquids containing large quantities of solids in suspension, and centrifugal pumps have been used for this purpose from the first with great success. Until lately the efficiencies of such pumps were of the order of all early centrifugal pumps, but recently the problem has been attacked by one of the most prominent builders of high efficiency centrifugal pumps, with the result that open impeller pumps have been produced for handling pulp which show efficiencies very close to those of the best closed impeller pumps of equivalent sizes handling clean water.

The impeller, shaft and case protecting or wearing rings of one of these pumps is shown by the accompanying photograph. The passages through the impeller are open, but the impeller blades run close to the rings, thereby shearing or cutting stringy material and keeping the pump from clogging. The impeller is of the double suction type, and hence balanced.

Two open impeller pumps handling liquid containing large amount of solids

The steel shaft of the pump is protected by a bronze sleeve which abuts against the impeller and extends through the stuffing boxes. To prevent rags or other stringy material from wrapping around the shaft there is, however, a stationary set of protecting sleeves shielding the shaft up to the impeller.

The pump casing is similar to the standard casing used with closed impeller pumps, in that it is divided horizontally by a plane passing through the center line of the shaft and the suction and discharge openings are in the lower half of the casings, so that the casing covers can be lifted off without disturbing the piping connections. When this has been done and the bearing caps also removed, the shaft, impeller and wearing rings can be lifted out. All parts subject to wear are quickly replaceable, as they are manufactured to limit gages on an interchangeable basis. The covers can be removed, inspection made, and the pump placed again in service in a short space of time.

It is no longer necessary to use inefficient pulp pumps in order to secure simplicity and reliability, as the new type of pump is more simple and accessible and more reliable than any other pump heretofore built.

A careful habit is the best bodyguard, says the National Safety Council.

Cause of Mildew in Felts

A RECENT investigation by F. C. Huyck & Sons of Albany, N. Y., manufacturers of paper makers' felts, as to the cause of rust or mildew in felts whereby they become rotted and unfit for use, developed that the trouble was caused by bacteria, the spores of which are almost always present in wool, but which propagate best when moisture and temperature conditions are favorable.

It was determined that the organism will grow at a temperature of from 50° to 98° F., but that it develops more rapidly at 98° F., than at the lower temperature. Moisture seems to be a necessity for growth, as it has been noted that absolutely dry wool at 98° F., remains perfectly normal.

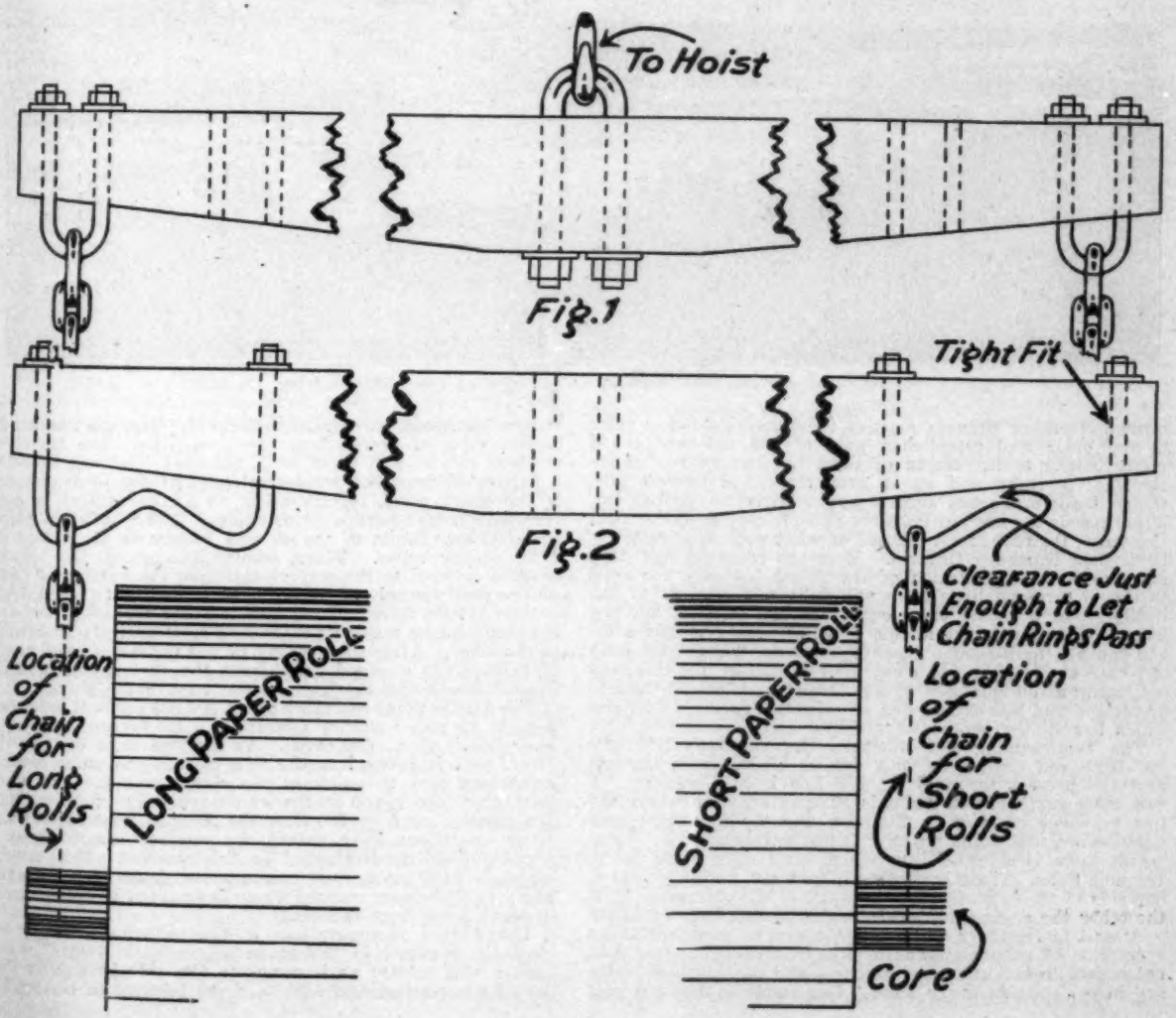
It, therefore, appears that wool felts should always be stored in a dry place at a moderate temperature, to insure security aginst the invasion of bacteria. No efficient method of sterilization has been discovered that will kill the spores of the organism without being injurious to the wool. Felts should not come into contact with brick walls, cement floors or steam pipes, nor be placed where there is any danger of the accumulation of moisture due to humidity.

For Lifting Rolls of Paper

AN idea in the construction of a lifting yoke for paper rolls which permits an easy adjustment for the lifting of different size rolls has been successfully worked out and used by a Mr. B. Vacatin, of Philadelphia, Pa.

From the accompanying illustration, the reader can easily see that in order to handle two different lengths of rolls with the yoke in Figure one, it would be necessary to change the location of the V bolt, while by employing the yoke in Figure two, the V bolt (double) remains stationary, and it simply becomes necessary to shift the chain from one seat of the bridge into another.

It is evident that by making the bridge many seated the same yoke can be used for many different lengths of rolls and thus save the time and labor involved in changing the location of the V bolt.



Farthest North in Paper Making

By E. L. CHICANOT

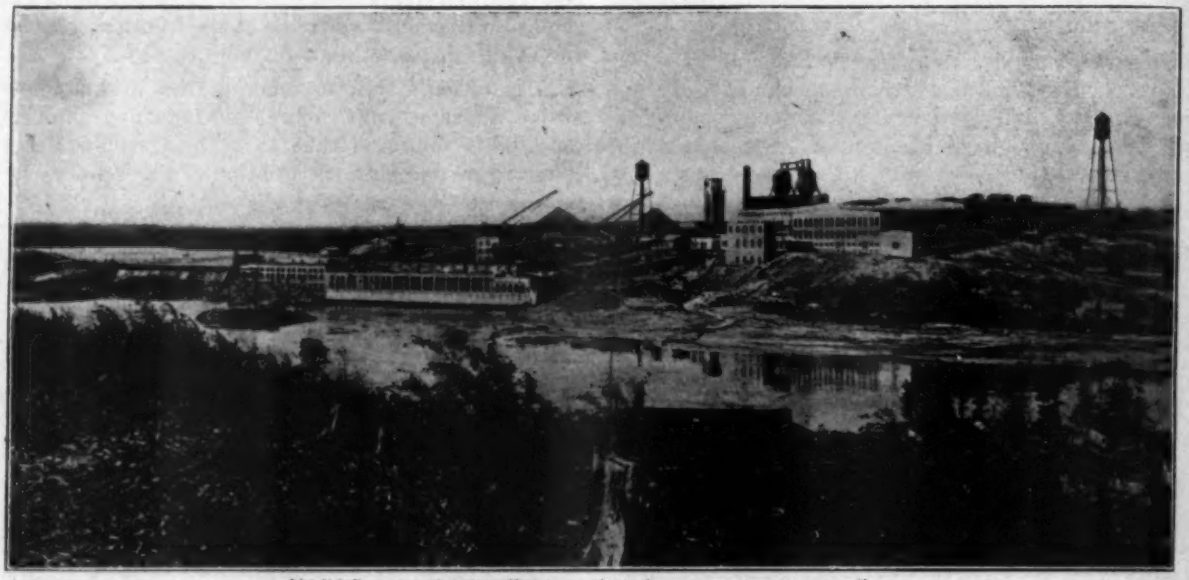
THOSE who labor under the impression that Northern Ontario is given over entirely to the various forms of mining which have given that area such sensational publicity of late, lose sight of the fact that this northern section of one of Canada's oldest provinces is estimated to contain 200,000,000 cords of pulpwood which, in view of depleting world resources, would not go long undeveloped and unexploited. There are established throughout Northern Ontario, at widely separated points, no less than eight pulp and paper plants which have been established almost entirely during the past decade and which year by year are coming to swell the total production of the province and have materially assisted in bringing the Dominion's paper output to a point where it represents at the present time about fifty per cent of the output of the entire continent.

Whilst these plants are all situated in what is generally termed Northern Ontario, most of them are situated so close to the older and established part of the province as to really belong to it. North of them for hundreds of miles stretches a rocky and burnt over mass and beyond this, where fresh untouched forests again begin, in virtual isolation stands the town of Iroquois Falls, harboring the Abitibi Company, the real forest pioneer of what may most properly be termed Northern Ontario. Here the company has done more than its exploitation of the forest, as only a visitor to the picturesque little town will fully understand. It has bodily hewn a model town out of forest vastness and set down civilization in the middle of wilderness! Whilst without doubt a hard-headed business concern, whose first duty is to see that shareholders get their dividends, the company is playing an unique part in the development of the Ontario hinterland and has established a microcosm in the wilderness which has all the aspects of stability and permanence.

The Temiskaming and Northern Ontario Railway is the backbone and central nervous system of Northern Ontario and the present terminal of this line is at Cochrane. A few miles south of this point is Porquis Junction where the line branches off west to Timmins and the Porcupine gold area before continuing on as a transcontinental line. Eastwards there is a branch line which runs eight miles out to Iroquois Falls. There is nothing in between, nothing beyond; one side of the line one hears of nothing but gold mining; on the other the engrossing affair is the manufacture of paper.

A visit to Northern Ontario is a series of surprises and a succession of misconceptions brusquely shattered. One does not expect to encounter the progress and development which are in evidence on every hand. One candidly didn't expect civilization had penetrated so far. But no matter to what extent one is moved by the marvels of progress this area can exhibit, Iroquois Falls always has the effect of astonishing the newcomer. The traveller has read stories of the woods and lumber camps and he is familiar with what are known as industrial towns. He looks for a combination of both.

Instead, as he enters on the train, he sees a giant plant on one side of the track and nothing else. He descends into what on the other side is a model town that would be a credit to a California or a Florida. Beside the station is a blooming park and separated from it by high nets a series of tennis courts. A golf course he sees over the way. From the park streets radiate in all directions, not haphazardly but in a manner which at once suggest an expert's hand. The houses are not in drab, monotonous rows, but semi-detached and in multiform styles of architecture. Each has its blooming flower garden about it. The town seems to be one mass of flowers and revels in color. The traveller wonders can he still be in wild, untamed Northern Ontario.



Abitibi Power and Paper Company, Ltd., Iroquois Falls, Ontario, Can.

Separated from the residential part of the town entirely is the giant plant reverberating at all times with a dull roar of eternally running machinery. Back of this plant stand timber limits of spruce and balsam to the extent of 1750 square miles. These woods throughout the winter months resound to the chip of axes and the buzzing of saws as the year's supply of timber is harvested and snaked down to the Abitibi river. From two to three thousand men are kept busy in the woods from the first frost until the ice breaks in the river. After the opening of the waters, a small army of drivers are engaged throughout the spring and summer months expediting the logs on the way to the plant.

The Abitibi plant consumes about 200,000 cords of wood per year in its paper making operations. Its average daily consumption is about 650 cords. As the logs come in from the river, part is taken into the mill to feed the never ceasing machinery and to maintain the day's output. The other part goes into giant stacks which are built up throughout the summer until by the time the river is frozen again and river operations have ceased for another season there is about 100,000 cords stacked in this manner. This supply, which is half the annual consumption, is to keep the mills going in the winter months when logs cannot be economically brought down from the limits.

The Abitibi Company has in the past been almost exclusively engaged in the manufacture of newsprint. The spruce and balsam as it comes to the mill in sixteen foot lengths is slashed and sent to drum barkers to remove the

bark. When barked, it is destined either for groundwood or sulphite and goes either to the groundwood mill or to the chipper. There are seven paper making machines, two of which are the largest newsprint machines in the world. The speed of all the machines is 700 feet per minute, and the two giant machines give a sheet of trim 221 inches wide. As the machines run 24 hours per day and 6 days a week, the enormous mileage of a week's output can readily be estimated.

There are about one thousand employees at the plant and their lot, as previously suggested, is an enviable one. Instead of the deprivations one might expect at a point so remote from what one is pleased to term civilization, the advantages of modern life have been taken out to them and given a setting of primal and untouched nature. The town seems to want for nothing in the way of convenience and diversion. The company owns the townsite, has built the houses and lets them to employees on terms that must be very reasonable since there is no record of an employee ever having desired to buy his house. There is a hotel for unmarried employees which has become the centre of social activities. There is a Y. M. C. A., a skating arena, recreation grounds and dance hall. Every night there is a social event of some order and time never permitted to grow dull. The literary and educative is blended harmoniously with the purely recreative, and thriving dramatic and literary societies exist whilst the company makes it its practice to periodically bring out lecturers of moment to address the various clubs.

A word should be said for the highly efficient and expeditious manner in which traffic and movement of all kinds is handled. As can readily be understood, such a plant has an enormous daily consumption of various materials which must be brought to the plant from outside as well as its output each twenty-four hours which must go out to its markets. Yet in spite of this, such a thing as a storage is unknown. As paper comes off the machine, its destination is known and there is never any accumulation. Materials come in just as they are wanted and there is never any stored up. This demands the most efficient traffic management which is effected from North Bay where every car, no matter on what part of the American continent bound for, or consigned from, the plant at Iroquois Falls is tabulated and its approximate location at any time known. Hand electric trucks at the plant work in an almost human manner doing the work of several men in moving about bundles of paper and loading cars and performing these duties in quite as efficient a manner.

The pulp and paper companies of Canada on the whole are doing an admirable work in developing Canada along sound and permanent lines and the Abitibi Company, the pioneer of the real Northern Ontario is no exception but to the fore in this regard. It is not a mere exploiter of the forests, a callous business organization to whom all efforts are directed alone to the making of dividends. They have established a system of progress which it is to be hoped will be copied and come to permeate the entire area of Northern Ontario's forests, when further exploitation will cause a greater and more adequate toll to be taken of them.

Importance of Emergency Closing Valves at the Boiler End of Steam Pipes to Large Turbine Units

P. W. KNAUF

Engineer, Schutte & Koerting Co., Philadelphia, Pa.

IT has for a long time been general practice to install gate valves at the boiler end of steam pipes serving turbine units so that the steam can be cut off when a turbine and its throttle valve are opened up for inspection, cleaning or repair. In order to operate such valves the attendants are obliged to climb to the top of the boilers. For this reason the valves are frequently equipped with motor drive, with control stations in the boiler room and elsewhere.

Motor drive, however, does not convert a large gate valve into an emergency shut-off valve. A gate valve cannot be made to close instantaneously. In fact, it should only be closed at times when there is no steam flow or opened when the pressures existing on both sides of the gate have been equalized by means of the by-pass customarily provided. Under such balanced conditions, with the usual size motor and gearing, the speed of closing the gate, that is, the rate of travel of the gate spindle is about 1 ft. per min. An 18 or 20 in. valve therefore requires nearly 2 min. to close by electric motor drive.

If for example the attendants are unable to get near the turbine throttle valve, as has happened frequently, or if the throttle valve is for some reason inoperative, then the motor driven gate valve must be depended upon to shut off the steam flow to the turbine, that is, the gate valve must close when the steam flow through it is, depending on the load, anywhere between 5,000 and 13,000 ft. per minute.

A far more severe condition is a rupture of the pipe between the header gate valve and the turbine. In such an event the gate valve must be closed instantly in order to prevent the boilers from being blown down. Under these conditions, the gate must be forced perpendicularly through a steam velocity that is many times in excess of full load flow because boiler pressure exists on one side of the gate and an open end or atmosphere on the other.

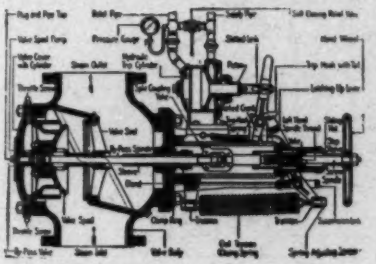


Fig. 1—Emergency closing valve in open position

The effect of closing a gate valve when a high velocity flow is passing through it is that the bottom edges of the gate or disc will be tilted or dragged in the direction of flow as these enter to close the ports. The result is that the gate will be jammed in the body guideways, and if not actually stalled, the speed will be greatly retarded and the power required enormously increased. Under the most favorable conditions, it is therefore unreasonable to expect the gate to complete the travel from the full open position to the shut position in the same time as under no flow conditions. In case of pipe rupture or turbine trouble time is precious. Instantaneous response to automatic or hand control is vital; to wait two minutes or even one minute under such conditions for a long travel valve to screw itself shut is entirely out of the question, especially when all the conditions are in favor of failure.

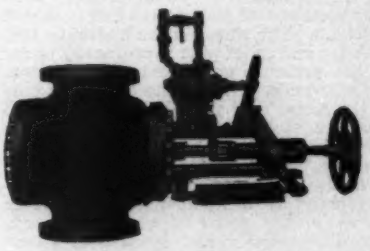


Fig. 2—Emergency closing valve showing relation of principal parts

An emergency closing valve must under the conditions enumerated close instantaneously but without shock. It must primarily be safe and dependable. The purpose of this article is to describe a new type of cushioned emergency closing trip valve that has recently been developed and installed in some of the large central station, lighting, and electric railway companies.

The valve, which is of the balanced combined trip and throttle type, is shown in the open position in Fig. 1, and consists of an easy flow excess and a globe body having a disc connected to a non-rotating spindle which, in turn, is suitably conected to a rotating spindle having a spindle thread. This thread engages with a nut that is free to slide in the yoke end or arch. Pivoted about a stationary fulcrum on the yoke is a lever, of which the shorter arm is connected to the yoke by means of a spring, and the longer arm is arranged to engage in a hook controlled by the tripping mechanism. This longer arm of the lever is known as the latching up lever, and is connected by means of pivots to the sliding nut mentioned above. The engagement of the latching lever with the trip hook is assisted by two tension springs, one on either side of the yoke. The steam inlet is above the valve seat and the outlet is below the seat—the disc therefore closes in the direction of the steam flow (not against the steam flow) and after having seated is held shut by the steam pressure.

Fig. 2 shows the general relation of the principal parts. The tripping mechanism of the valve shown in Figs. 1 and 2 is actuated by a hydraulic cylinder under 25 to 75 lbs. water pressure. The mechanism can, however, be electrically operated on 125 or 250 volts direct current.

Operation

The operation of the valve is as follows, see Fig. 1: Assume that a pipe rupture occured on the outlet side of the valve, or that the steam pressure has dropped below the minimum

allowable boiler operating pressure. This in turn will cause a diminution of hydraulic pressure in the relief type, thereby causing the piston in the hydraulic trip cylinder to be moved to the left. Under these conditions, the latching up lever is disengaged and the unbalanced steam pressure acting on the top of the main valve disc and the non-rotating valve spindle closes the valve instantly. The closing is assisted by the coil tension closing spring.

To open the valve, it is first necessary to turn the hand wheel in a clockwise direction, whereupon the sliding nut is moved toward the valve body and the latching up lever re-engaged with the trip hook. Thereupon turning the hand wheel in a counterclockwise direction forces the disk off its seat and opens the valve.

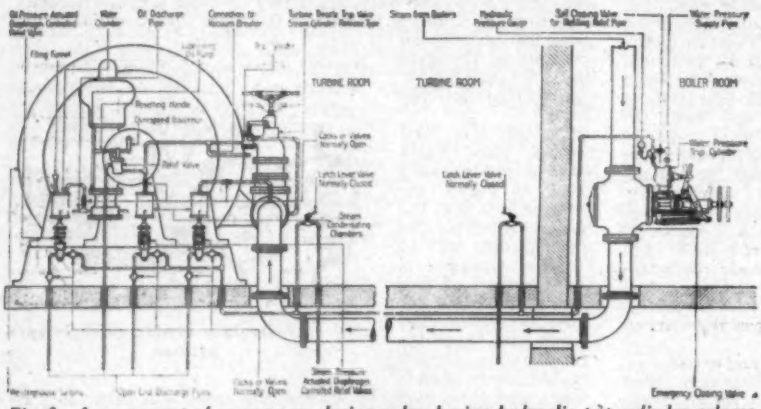


Fig. 3—Arrangement of emergency closing valve having hydraulic trip cylinder release for use on steam mains to large turbine units

A typical arrangement of the valve having a hydraulic trip cylinder release with four methods of distinct control is shown in Fig. 3. The water in the hydraulic trip cylinder and relief pipe is ordinarily under 25 lbs. pressure gage, and is taken from the city main or from the discharge side of the boiler feed pump. It is introduced into the system through a self-closing valve that is closed as soon as the relief pipe has been filled. There are four methods of distant control provided respectively by a number of latch lever valves in the relief pipe, a diaphragm controlled relief valve operated by steam pressure in the steam pipe serving the turbine, a second such relief valve operated by the overspeed governor, and a third relief valve actuated by the pressure of the lubricating oil.

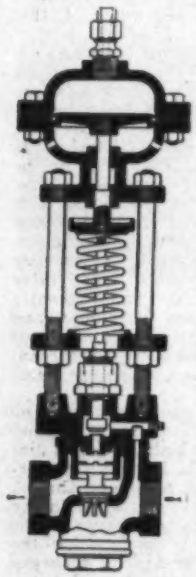


Fig. 4—Diaphragm controlled relief valve for actuating emergency closing valve

The latch lever valves are normally closed and are hand operated. Any number of them can be installed. If a latch lever valve is opened, a flow of water occurs in the relief pipe, thereby diminishing the hydraulic pressure to the left of the piston in the trip cylinder, releasing the latching up lever and tripping the emergency closing valve.

The diaphragm controlled relief valves are of the type shown in Fig. 4. A diminution in pressure in the chamber above the diaphragm permits the spring to rise and to open the valve, thus permitting a flow of water to occur through the bottom of the valve.

Ordinary cocks are installed on the relief piping on either side of each of the diaphragm controlled relief valves. These cocks are normally open. When the overspeed governor of the turbine is to be tested, when steam pressure is being built up, or oil pressure is being built up, the cock immediately before each diaphragm valve is open, but the other one is closed. These cocks also permit inspection or removal of the diaphragm valves while the turbine is in operation.

The emergency closing valve is adapted for use with various methods of control in addition to the one described above. Fig. 5 shows an arrangement of the so-called closed circuit direct current type, 125 to 250 volts.

Here an electro-magnet is utilized, the armature of which is a swing weight that, when the circuit through the magnet is broken, drops and trips the closing valve shut. Current flows continually through the electro-magnet, one or more self-closing push switches, a diaphram contact breaker (the contacts of which are normally closed), actuated by the steam pressure, through a second diaphram contact breaker actuated by the lubricating oil pressure, and finally through a switch on the turbine throttle trip valve. The electro-magnet, push switches, contact breakers, etc., are all connected in series.

The contacts of the switch on the throttle trip valve are normally closed. They are broken by the tension rod of the overspeed governor when the turbine overspeeds. Under these conditions, not only does the turbine throttle trip valve close, but inasmuch as the switch is opened, the emergency valve is also closed.

Fig. 6—Diaphragm type pressure regulator

Here, as in other arrangement, four methods of distant control are available, of which any one or all can be used. Three indicating switches are ordinarily installed for short circuiting the contacts of the diaphram circuit breakers so that the overspeed governor can be tested when necessary, or the oil pressure and steam pressure can be built up without tripping the emergency closing valve.

One type of diaphragm breaker is shown in Fig. 6. This is merely a device whereby a diminution in pressure is utilized to cause a movement of the diaphragm to open an electric circuit, thereby breaking the circuit through the magnet of the emergency closing valve, releasing the swing weight, and tripping the valve shut. Other arrangements and types of pressure control apparatus have been utilized. The one shown is merely typical.

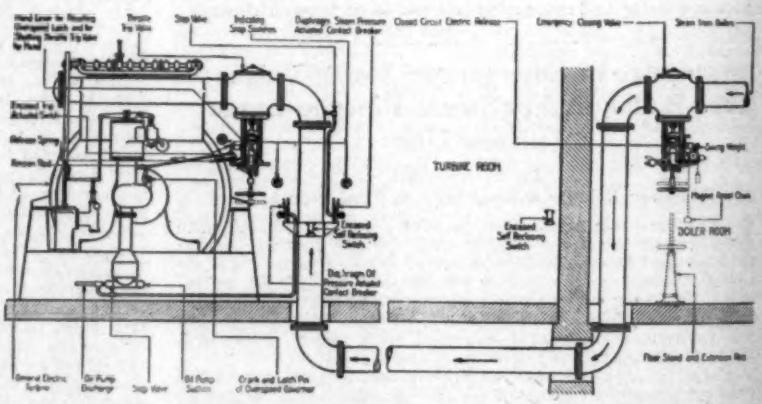


Fig. 5—Arrangement of emergency closing valve with closed circuit D. C. electric release mechanism, for use on steam mains to a large turbine unit

As stated above, the emergency closing valve can be made to close either when the steam pressure in the steam supply pipe to the turbine falls any predetermined amount below the minimum allowable operating pressure, or when the pressure of the lubricating oil becomes dangerously low, or finally, when the turbine overspeeds. It insures instant protection.

A New Forced Draft Stoker

THE Green Engineering Company, East Chicago, Indiana, has announced the Green Forced Draft Chain Grate Stoker. This stoker represents a new design in forced draft chain grate field. It is designed to operate with equal responsiveness under either natural or forced draft, as the load demands.

This stoker has been under observation for several months at the Mill Street Station of the Indianapolis Light and Heat Company, where it has been tried under every variation of central station condition.

This stoker was designed for burning bituminous coals. Outside of its performance the most striking feature about it is the liberalness of the entire design. This liberalness emphasizes both accessibility and low operating costs.

The stoker has five active compartments. Each of the five compartments is entered by a door and is large enough to permit a man to crawl through from one side to the other of the stoker. This accessibility makes it practical to carry out much desired inspection of all air seals and the internal condition of the stoker.

The idea of liberal areas is carried throughout the forced draft air supply system. All ducts and conduits are large.

The air space in the chain is practically the same as in natural draft stokers. This is evidenced by natural draft performance up to 150 percent of rating.

The wide open chain and liberal areas make it possible to operate with minimum air pressures at the highest forced draft rating. Uniform air distribution is accomplished by the large compartments rather than by accumulated pressures. This principle is new in the forced draft field.

These low pressures have naturally resulted in low cost of auxiliary power.

In designing this stoker and furnace the company has recognized maintenance as one of the vital points to be considered in connection with the high rating sometimes necessary. To offset the known deterioration of sidewall brickwork at high ratings the forced draft fuel bed is surrounded on both sides and at the rear by water-cooled members. Specially designed sidewall tubes protect the sidewalls. Pressure waterbacks and fuel retarders seal the rear and protect the bridgewall overhang.

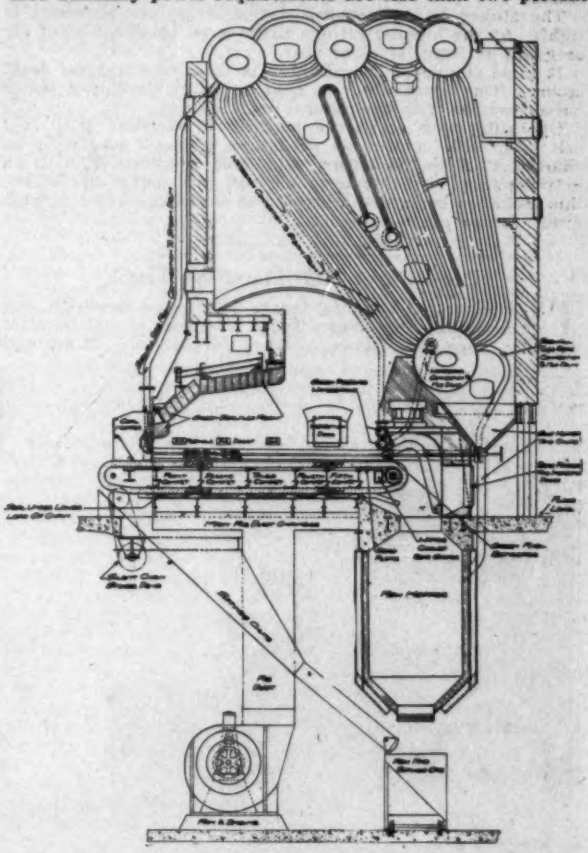
The Sealflex arch used with forced draft is designed to give the highest possible ignition rate compatible with low maintenance.

Air is supplied from the bottom for forced draft operation. The firing aisles are left entirely free of obstructions.

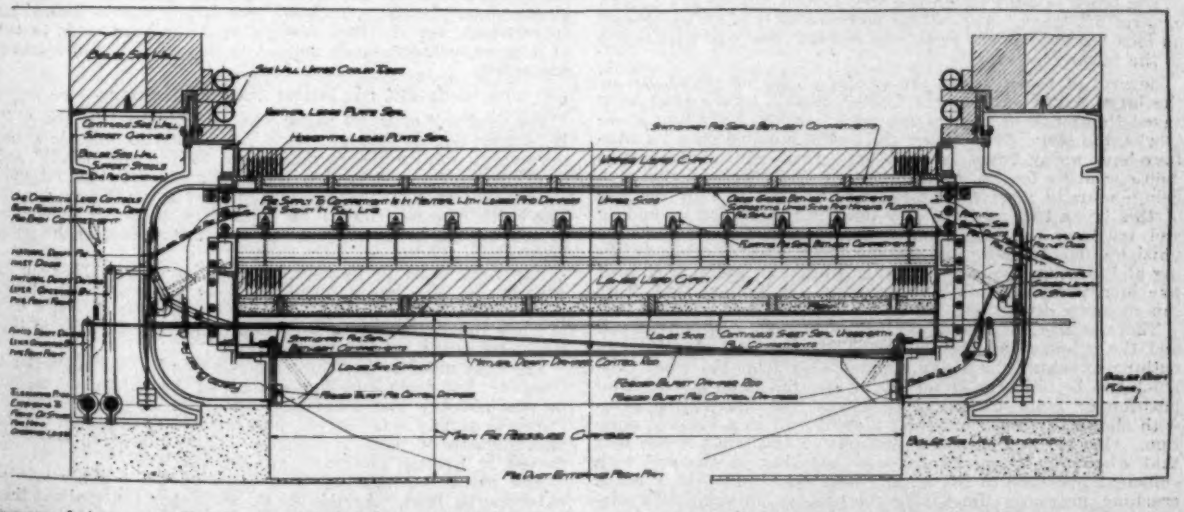
According to the company this stoker has demonstrated the following features under practical operation:

It meets every demand for flexibility in carrying the load. Firing rates up to 150 percent of boiler rating are carried with natural draft. Extreme high rates under forced draft are available at all times.

Efficiencies are high at all ratings, losses of the combustion carbon. Efficiency losses for auxiliary power are designedly at the minimum. The stoker requires less than one half of one percent of the steam generated for driving the stoker under natural draft operation. Because of the low velocities used auxiliary power requirements are less than two percent



of the steam generated when forced draft fan is added at maximum ratings. No other auxiliary power is required. The stoker is built into the sidewalls and is tight. There is no infiltration loss here. Due to air control by compartments there is no loss due to unauthorized air entering the furnace through uncovered parts of the grate at low rates of operation. Banking period coal costs are extremely low, due to ability to shut off air from entering through the grate.



process being controlled by special features of design. Fuel loss to the ash pit is held at the minimum by the special design at the tail end. The ash definitely separates from unburned carbon. The fuel retarder causes any air that enters the furnace under natural draft at the tail end to pass through the ash layer, thus burning out any remaining particles of

This stoker has carried every rating obtained to date for eight hour periods or longer. Total absence of clinker, con-

tinuous ash discharge, absence of hot parts or members and any strain would indicate that the stoker will perform indefinitely at any rating. The company points to this continuous performance as one of the most attractive features of the stoker.

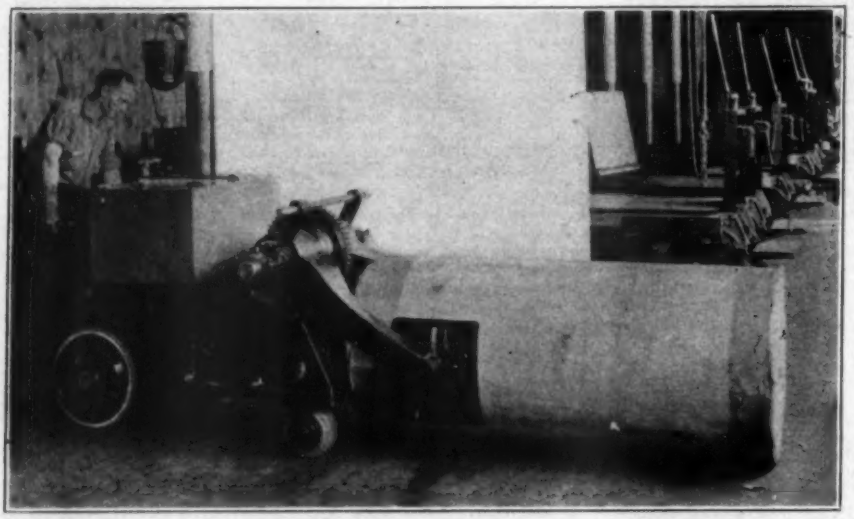
The stoker has demonstrated that every compartment is tight. At the highest ratings there is no blowing out of air or gases at front, sides or rear.

It is as simple of operation as is the Green natural draft stoker. One attendant can tend as many developed boiler horsepower as with the natural draft stoker.

Operating with no part overheated or strained, with cold ash pits, with continuous discharge of dead ash, with no "blowouts" from the setting, with free firing aisles, with an extreme simplicity, flexibility and high combustion efficiencies, this stoker is being demonstrated to those interested in high grade forced draft equipment.

Pope Paper Roll Handling Truck

THIS paper roll handling truck, illustration herewith, was developed by the Cowan Truck Company in collaboration with Mr. Pope of the Pope Alliance Corporation. It answers



a long felt need in the average paper mill, in the publishing house, and in all places where large bulky and heavy paper rolls are being handled.

The truck is built up on the well known unit of the Cowan electric lift truck. The lifting mechanism is built up around an idea devised by Mr. Pope who has had years of experience in the paper industry.

Several of these trucks are in use at the plants of one of the large paper mills in the United States, where they have saved thousands of dollars annually. Before installing these trucks, the large 72 in. paper rolls were handled on a twenty-four hour a day basis by seven men per shift. These seven men operating for finishing up-ending and trucking, five men being actually used for up-ending the rolls. With the use of this truck two men are now used per shift, for up-ending and trucking to the shipping department. Both men are finishers, one finishing and driving the truck, the other finishing and heading the roll. In other words, an initial saving of five men per shift has been effected. In dollars and cents this means a saving on a 300 day annual basis of over $21,000.

There is also a material saving in time of handling the roll and the greatest saving by far is in transportation, to say nothing of taking the heavy manual labor from the men. The truck can be used for either lifting the roll from a horizontal position or from a vertical position. The illustration herewith shows the truck handling a short roll in a vertical position. One of the distinctive features of the truck is the fact that when the lifting hands come together on the roll with sufficient pressure to lift it, and note here that this is not a crushing pressure, the lifting mechanism automatically elevates the roll. The speed adjustment of the truck is so regulated that the truck can be maneuvered up to a roll so as to eliminate any possibility of breaking the edge of the roll while lifting. The speed adjustment of the truck is so regulated that the truck itself is equipped with General Electric motors, with Exide batteries as standard equipment with Brown-Lipe-Chapin differential, Alemite system of lubrication throughout, Cutler-Hammer controller, and the entire mechanism is ruggedly constructed for heavy duty.

Three-thirty Renewable Fuse Plug

The Federal Electric Company have recently placed on the market a new renewable powder packed fuse plug, very novel in design which they claim will not only save the blowing of a great number of plugs because of the time element feature, but also will save hundreds of thousands of dollars by preventing small motors and apparatus from being destroyed.

Their time element feature and powder packed renewable element which they use in the fuse plug, solves the problem of taking care of the excess currents of short duration due to starting torque and small line surges; eliminating the necessity of using a plug three or four times the rating required to take care of the normal running current in order to withstand the short duration excess currents.

Its construction—only three parts—is very simple, yet most effective. The parts are—the outer case—the cartridge holder —and the powder-packed renewable cartridge; it can be reloaded in but a few seconds without the use of any tools. The plug is built very rugged to withstand innumerable short-circuits and ordinary overload blows, without the injury to the holder itself. Likewise, very large contact surface and substantial metal is used to give the best of contact. In all, the plug is built to outlast many times any plug that has ever been invented up to the present time. While the plug is a renewable plug, only the element furnished by the manufacturer can be used. This insured an absolutely fool proof plug that cannot be accidentally or intentionally overloaded.

This new plug is called the Federal Three-Thirty Renewable Fuse Plug. Its distinct advantage is its absolute dependability in withstanding the short excess currents due to high starting torque and the small line surges and yet its positive accuracy in blowing within the required time to protect the apparatus. The same renewable element that is used in the Three-Thirty Time Limit powder-packed renewable fuse plug is used in this regular 3-30 ampere 250 volt cartridge fuse.

The company has realized for some time that in the class of service for protecting small power motors, such as—washing machine, vacuum cleaner, bench motors, heating apparatus, mercury arc rectifiers, mercury arc lamps had to depend on fuses which, for the past few years, have been made to sell at a price, without much regard to dependability and actual protection.

A Bit of Toilet Paper History

The first roll of toilet paper was made in 1871 by the A. P. W. Paper Co., of Albany, N. Y. Previous to this time, the tissue was sold in sheets measuring 15"x20" or 18"x24" and torn into quarters. In hotels the supply of tissue was retained at the desk where it was applied for just as stationery is now. The Fifth Avenue Hotel, New York City, made an innovation by leaving the tissue in the care of an attendant in the hotel lavatory.

The first hotel to introduce the roll was The Delavan in Albany, N. Y. Being accustomed to the enormous sheets before spoken of, this hotel required enormous sheets, 6"x8", in their rolls. Therefore for a long time special rolls in this size were made up for the Delavan.

The next hotel to introduce the roll was located in Portland, Oregon. And from that time the use of the roll spread rapidly in this country and England where the British Perforated Paper Company was formed, and machinery imported for the manufacture of rolls in London. Later machines were imported in France, Germany and Switzerland.

The patents controlling this form of toilet paper service extended to 1888. As the A. P. W. Paper Co. realized that competition would be keen as soon as the patents expired, they invented a new form of service from cabinets. This is the "Onliwon" service which consists of interfolded sheets.

Few people of this generation realize that the roll is an ingenious device, worked out not so many years ago by an inventive brain.

Co-operative Competition and the Service Associations

By T. J. BURKE, C. A.
Secretary-Treasurer, Cost Association of the Paper Industry

THERE are four service associations affiliated with the American Paper and Pulp Associations, i. e., Technical, Superintendent's, Salesmen's and Cost. For some reason unknown to me, the purchasing agents have not any associations. During the joint convention held by the Superintendents and Cost Associations at Kalamazoo recently, one of the executives present stated that in his opinion it would be desirable if such an association were formed. In this connection I might mention that the National Association of Purchasing Agents recently got out a standard invoice form and for the last two weeks I have been expecting to receive 400 copies of this form from them, which I propose to send to all the members of the American Paper and Pulp Association and the Cost Association, for an expression of opinion from the purchasing agents as to whether they thought it would be desirable to go on record as being in favor of the adoption of this standard invoice form.

But to go back to the service associations now in existence. Undoubtedly the closer co-operation there is between these four service associations in their work, the better will be the results which will be attained. Co-operative competition is to take the place of the old "cut throat" kind, as is clearly foreshadowed in an address given by the Hon. Nelson B. Gaskill, chairman of the Federal Trade Commission, on June 8th, in Chicago, before the National Association of Wholesale Grocers, on the subject of "Some Aspects of Price Cutting." One very significant passage of this address reads as follows: *"Because I believe that selling below cost is an unfair method of competition, I believe that a group agreement not to practice this method of doing business is a lawful agreement."* Mr. Gaskill also refers to an address which he wrote at the request of this Association to be read at our convention in Chicago in October last year as follows: "In an address delivered before the Cost Association of the Paper Industry, October 7, 1921, I advanced the proposition that each individual business unit should ascertain its own cost and fix its own selling price with due reference thereto. I urged upon trade associations the opportunity and the necessity for education in cost accounting methods among their members. That argument is a necessary element in the proposition which I am stating here. Unless cost is known, profit is unknown, and whether a selling price is below cost is a matter of guess work. The business man who fixes his selling price without accurate knowledge of his production cost and without keeping above it is on an industrial joy-ride. He is not only in peril himself but *he is a constant source of danger to others.*"

This address of Mr. Gaskill's contains many other very significant paragraphs which all lead to the conclusion that the Chairman of the Federal Trade Commission is convinced of the great harm that is being done to industry throughout the country by manufacturers who ignorantly sell their products below cost. His address is certainly a clear indication of the necessity for the work which the Cost Association is endeavoring to carry on and copies of it will shortly be distributed by us.

The four service associations must therefore draw closer and closer together in their endeavor to promote manufacturing and selling efficiency because the time is undoubtedly ripe for bringing about the desired results. The Cost Association foresaw the necessity for this co-operation when last December it approached the Technical and Superintendents' Associations with a suggestion that the three Associations should hold a joint convention. Unfortunately the Technical Association had already made arrangements for their spring convention so was not able to accept this invitation, but after certain preliminary arrangements had been made, the Superintendents consented to hold such a convention, provided the Cost Association would be willing to again go to the Middle West and meet with them at Kalamazoo on June 1st, 2nd and 3d. Being fully advised of the importance of gaining the good will of the operating men if accurate cost figures are to be obtained, the cost men decided to do this, although it was the turn of the East for the convention. The action taken was, however, fully justified by the great success which attended the joint convention.

The four speakers selected by the Cost Association to represent them in the joint sessions were Geo. A. Galliver, President American Writing Paper Co., C. Oliver Wellington, C. P. A. of the firm of Scovell, Wellington & Co., W. G. MacNaughton, Secretary-Treasurer, Technical Association of the Pulp and Paper Industry (who was selected because we wished to emphasize the importance which we attach to the work of the technical men in the industry) and Jas. A. Reilly, Manager Cost and Inventory Department, American Writing Paper Co.

The addresses given by these gentlemen were of the highest order and undoubtedly contributed a great deal to the success of these joint sessions. Another good speaker who was, however, selected by the Superintendents, was J. H. Slater, whose address should be read by all superintendents and cost men.

The significance of the joint convention lies in the fact that it was the first attempt that has been made by any of the service associations to get together in this manner. We feel sure that it is the forerunner of a good many other similar conventions which can only be productive of the greatest amount of good in the industry. We understand that arrangements are already being made by the Technical and Superintendents' Associations to hold a joint meeting this fall.

I confess that during the convention I was struck by the very real interest shown by the superintendents in the efforts being made by the cost men to place squarely before them the facts regarding cost statements and their significance both to the operating men as well as to the executives. I believe that as a result of the convention a large number of superintendents will co-operate much more closely in the future with their cost departments because some of the best among them went on record as being unequivocally convinced of the benefits which they had derived from the statements and reports which they had been in the habit of receiving from their respective departments.

Paper is made on expensive machines after somewhat unusual manufacturing processes and it is *not* an easy matter to keep a close check on the manufacturing costs. It is only within recent years that a real effort has been made to ascertain these costs. Prior to this, the superintendent made paper as cheaply as he knew how and had no other guide but his own good common sense as to whether there was any great waste in the mill. All this has now been changed and the superintendent's work made correspondingly easier. The superintendent nowadays who does not take full advantage of the information given him by the technical and cost men is undoubtedly at fault and this will become increasingly apparent as competition becomes keener, as it will do, year by year, for several years at least.

It was clearly brought out at this convention that it is certainly the superintendent's duty to see that the men under his control in the mill are trained to properly fill in the cost records which will enable the Cost Department to accurately compile the cost as well as to make prompt reports regarding the efficiency or otherwise of the various departments in the mill. If a superintendent co-operates closely with the Cost Department in this manner he will in turn undoubtedly receive very valuable data from that department which will assist him materially in "carrying on."

Therefore we believe that the joint convention held at Kalamazoo by the Superintendents and Cost men was a great step in the right direction because in future any superintendent who desires information on cost matters will feel free to write to the Cost Association as to a friendly organization which is only to anxious and willing to assist him in his work to the best of its ability.

Canadian Pulp Exports

Exports of Canadian pulp and paper in May were valued at $8,522,830, compared with $6,490,359 in April and $7,929,525 in May, 1921, according to a statement issued by the Canadian Pulp and Paper Association. United States received the greatest share of exports, accounting for $7,034,141.

Association Papers

Report of Committee on Standard Methods of Testing Materials*

By F. BECKER, Chairman

I. Your Committee on Standard Methods of Testing Materials found that in the past several analytical and testing methods had been proposed. Sufficient work, however, had not been done to determine the practicability and accuracy of these methods in order to accept same as standards of the pulp and paper industry.

Your committee, therefore, undertook an investigation of these previously proposed testing methods. Besides this, an extensive investigation was made of the color effect of rosin size emulsion on finished product. Also your committee investigated specifications for lime for use in causticizing, proposed by the Bureau of Standards.

II. A few committee members reported that they were not able to assist in the work, but I was successful in getting Miss Helen U. Kiely, of American Writing Paper Co., and Mr. C. H. Kent, of the Paper Makers' Chemical Co., to serve on the committee. Miss Kiely has been of a particular value to the committee, as she had assisted the former chairman, Mr. Tucker, in drawing up the testing methods proposed at last year's meeting, and which are the methods which your committee have had under investigation.

III. Standard samples of the above mentioned materials were sent to a number of pulp and paper mill laboratories with the proposed testing methods attached. The results of this analysis and comments on the methods were collected and will be reported on by the various committee members.

This committee is satisfied that the above mentioned methods are now in such shape that it can safely recommend same to be adopted as standard, and trust that it may have the support of the T. A. P. P. I.

Aluminum Sulphate

Last year at the Technical Association meeting methods were proposed for analysis of various materials used in the pulp and paper industry. These methods were not adopted at that session, as sufficient data was not represented to ascertain their suitability. It was decided at that time o have various methods tested by various chemists, and if the methods proved satisfactory to have them adopted as the standard methods of the T. A. P. P. I.

The method proposed for the analysis of aluminum sulphate has been tested by six laboratories. The results obtained warrant the adoption of this method as a standard, with the following corrections. These corrections are not fundamental, but rather in manipulative detail:

1. It has not been found necessary to add tannin to coagulate the aluminum hydroxide when precipitated with ammonia.
2. The double precipitation of alum is not necessary, as the impurities occluded would be negligible.
3. The determination of sulphates in alum is unnecessary. This may better be calculated from the aluminum determination.
4. As the Jones Reductor is often not available, the reduction of the iron by means of stannous chloride with additions of mercuric chloride and manganese sulphate is recommended as an alternative method. This method is given in detail below.

Dissolve 5 gr. of the alum in 100cc water in a 600cc beaker. Bring the solution to boiling, and add 3 or 4 drops of stannous chloride solution (1).

Cool rapidly and dilute with about 400cc dist. water. Add 15cc saturated mercuric chloride solution (2).

The stannous chloride reduces the ferric-ions to ferrous and the mercuric chloride oxidizes the excess stannous to stannic-ions.

The iron, now present in the solution in the form of ferrous-sulphate, is determined by titration with N/10 permanganate solution after the adding of 10cc manganese sulphate solution (3).

Calculation: Number of cc N/10KMNO$_4$ × 0.008/5 = % Fl_2O_3.

(1) *Stannous Chloride.* Disolve 250 gr. $SnCl_2$ in 200cc conc. HCl and dilute to 2 liters.

(2) *Mercuric Chloride.* Saturated solution of $HgCl_2$.

(3) *Manganese Sulphate.* Dissolve 67 gr. of manganese sulphate ($MnSO_4 — 4H_2O$) in 500cc water; add 138cc Phosphoric Acid and 130cc conc. H_2SO_4 and dilute to 1000cc.

NOTE: If, after the adding of mercuric chloride, the solution turns gray of reduced mercury, repeat the analysis, because this indicates the use of too much stannous chloride.

The volumetric method for the determination of combined alumina is recommended where determinations are made daily. The preparation of reagents for an occasional analysis makes this method impracticable. The method as tested proved very satisfactory for routine testing.

Method of Basicity or Acidity in Alum

The Potassium Fluoride method for the determination of basicity or acidity of aluminum salts, as presented last year, has been tried out, and very good results obtained. No other method tested gave any satisfaction. It is recommended that this method be adopted as proposed.

NOTE: It might be well to add a blank should be run on the potassium fluoride if the solution is not absolutely neutral.

The following data shows actual tests run by three different chemists using this method, with very close results:

	1.	2.	3.
Sample No. 1—Free Al_2O_3.....	.39	.46	.49
Sample No. 2—Free Al_2O_3.....	.19	.23	.23
Sample No. 3—Free H_2SO_4.....	2.57	2.71	2.74

The following laboratories co-operated in the work on a standard method for aluminum sulphate.

Kalamazoo Vegetable Parchment Co., Kalamazoo, Mich.
Lee Paper Co., Vicksburg, Mich.
Ohio Boxboard Co., Cleveland, Ohio.
Westfield River Paper Co., Russell, Mass.
Hammermill Paper Co., Erie, Pa.
Hamersley Mfg. Co., Garfield, N. J.
American Writing Paper Co., Holyoke, Mass.

Determination of Basicity or Acidity of Aluminum Salts

The procedure is based upon the fact that an excess of neutral potassium fluoride decomposes aluminum salts in solution, forming two stable compounds which react neutral to phenolphthalein, while the free acid remains unaltered, the following reaction taking place:

$Al_2(SO_4)_3$ 12KF xH_2SO_4 = $2AlF_3.3KF$ $3K_2SO_4$ xH_2SO_4.

The precipitate $AlF_3.3KF$ is insoluble in an excess of the potassium fluoride reagent, and is not appreciabfy attacked by acids or alkalies. Theoretically about 7 parts by weight of potassium fluoride are required for one part by weight of aluminum sulfate, but in actual practice it is advisable to use twice this amount.

Reagents Required—Standard solutions of sulfuric acid and potassium hydroxide. Half normal solutions have been found to be of suitable strength. Sodium hydroxide may be used in place of the potassium hydroxide.

Phenolphthalein Indicator—Alcoholic solution containing 9.1 per cent of the reagent.

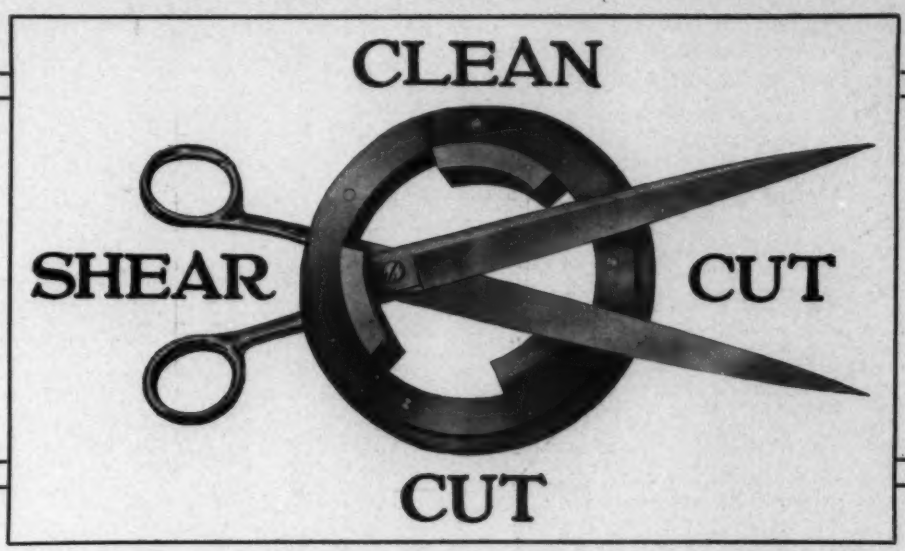
Potassium Fluoride—The reagent may be prepared by dissolving 1000 grams of potassium fluoride in 1200 cc. of hot CO_2-free water, then neutralixing the solution with alkali or hydrofluoric acid as the case may require, using 5 cc. of phenolphthalein indicator. Dilute sulfuric acid may be used in place of hydrofluoric acid in the final adjustment to get a neutral product; 1 cc. of the solution in 10 cc. of CO_2-free water should appear a faint pink. The concentrated mix is filtered if necessary and then diluted to 2000 cc. with CO_2-free water. The gravity will now be approximately 1.32 (about 35° Bé.): 1 cc. contains 0.5 g. potassium fluoride salt.

Method of Procedure

Solids—3.4067 grams of the finely ground sample or an equivalent amount in solution (100 cc. sample containing 34.607 grams per liter) are taken for analysis. The powder is dissolved by boiling with 100 cc. of distilled water in a 4-inch casserole with clock glass cover. To the hot solution 10 cc. of N/2 H_2SO_4 are added, and after cooling to room temperature (20° C.), 18 to 20 cc. of the potassium fluoride reagent are added and ½ cc. of phenolphthalein indicator. The solution is now titrated with N/2KOH, added drop by drop until a delicate color, persisting for one minute, is obtained. This titration shows whether the product is basic or acid.

Basic Alumina—This is indicated when the alkali back titration is less than the amount of acid added. Free Al_2O_3 = (cc. H_2SO_4 — CC.KOH) ÷ 4.

*Delivered at the seventh annual convention of the Technical Association of the Paper Industry, held at the Waldorf-Astoria Hotel, New York City, on April 10th, 1922.



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Free Acid—In this case the back titration of the alkali is greater than the cc. of acid added. Free acid = (cc. KOH — cc. H_2SO_4) × 0.72.

Liquors—In works control of liquors the specific gravity is taken: 5 cc. are diluted to 100 cc. with CO_2-free water, 10 cc. of N/2 H_2SO_4 added and the solution boiled for about five minutes. After cooling, the potassium fluoride reagent is added, together with phenolphthalein and the titration with the standard alkali made as in case of solids.

Basic Mixes—(Cc. H_2SO_4 — cc. KOH) × 0.0245 × 0.3473 × 100) ÷ (5 sp. gr.) = free Al_2O_3.

Acid Mixes—(Cc. KOH — cc. H_2SO_4 × 2.45) ÷ wt. of sample = free H_2SO_4.

Neutral Mixes—The back titration of the alkali is the same as the volume of the acid added.

Notes

CO_2-free water must always be used in titrations with phenolphthalein indicator. This may be obtained by boiling water to expel CO_2.

Lime for Causticizing

The attached specifications for lime for use in causticizing have been tried out and works entirely satisfactory. The proposed method for available lime has been tested against several alternative methods for lime and has proved very accurate, quick and simple to run. In view of the fact that this method has been adopted by the Bureau of Standards in cooperation with the interdepartmental conference on chemical lime, it is recommended that the T. A. P. P. I. adopt it as their official method.

Specifications for Lime for Use in Causticizing

1. *General*

(a) Definition of Lime—Lime is the product resulting from the calcination of limestone. It will slake when water is added to it, and this slaking is accompanied by an evolution of heat, an increase of volume, and the formation of calcium hydroxide.

(b) Use of Lime in Causticizing—Lime is added to solution containing alkali carbonates for the purpose of forming the corresponding hydroxides, or caustic alkalies. These remain in solution, while calcium carbonate is precipitated. The solution and precipitate are separated; the solution is concentrated by evaporation to the extent desired for the object in view, and the calcium carbonate sludge is either converted in lime or discarded.

(c) Quality—The impurities ordinarily found in lime, and which include underburned and overburned lime, retard the slaking process. They also increase the volume of the sludge, which then either requires more time in washing or carries off more inclosed caustic alkali. Magnesium compounds do not settle either quickly or well in the solution of caustic. The presence of any impurities thus introduces delays which reduce the efficiency of the equipment.

(d) Packing—Quicklime is shipped either in bulk in carload lots, or in barrels holding 180 or 280 pounds net each.

2. *Requirements*

(b) Composition—The standard of composition for quicklime for use in causticizing shall be a content of 85 per cent of available lime.[1] Lime containing more than 3 per cent magnesia or less than 70 per cent of available lime shall be rejected as uneconomical to use.

All percentages enumerated herein are based on the weight of the sample as received at the laboratory.

(c) Marking—Each carload of material or fraction thereof shall be legibly marked with the names of the consignor and consignee, and with some means of identifying the particular contract on which the shipment is made. This information is in addition to that required by the federal lime barrel law.

(d) Retesting—Notice of the rejection of a shipment based on these specifications must be in the hands of the consignor within ten days after the receipt of the shipment at the point of destination. If the consignor desires a retest, he shall notify the consignee within five days of receipt of the notice of rejection. The consignee shall provide all reasonable facilities to permit the consignor to resample the material. The retest shall be at the expense of the consignor.

3. *Sampling and Testing*

(a) Sampling—The purchaser will bear all expense of sampling and testing. When quicklime is shipped in bulk, the sample shall be so taken that it will represent an average of all parts of the shipment from top to bottom, and shall not contain a disproportionate share of the top and bottom layers, which are most subject to changes. The sample shall consist of one shovelful for each three tons of material, but not less than ten shovelfuls (for each three tons) taken from different parts of the shipment. The total sample taken shall weigh at least 100 pounds, and shall be crushed to pass a one-inch ring, mixed thoroughly, and "quartered" to provide a 15-pound sample for the laboratory. In case a shipment consists of more than one car, a separate sample shall be taken from each car.

When quicklime is shipped in barrels, at least 3 per cent of the number of barrels shall be sampled. They shall be taken from various parts of the shipment, dumped, mixed, and sampled as specified in the above paragraph.

When sampling quicklime, it is essential that the operation be conducted as expeditiously as possible, in order to avoid undue exposure of the material to the air. The sample to be sent to the laboratory shall immediately be placed in an air-tight container, in which the unused portion shall be stored until the shipment has been finally accepted or rejected by the purchaser.

The sample may be taken either at the point of shipment or at the point of destination, as agreed upon by the contracting parties.

(b) Testing—Details regarding the complete analysis of lime are given in other papers of this series and in Bulletin 700 of the United States Geological Survey.

Available Lime

1. Weigh 1.4 g. of the carefully prepared and finely ground (passing a No. 100 sieve) lime into a 250 cc. beaker, add 200 cc. of hot water, cover, heat carefully and then boil for 3 minutes.

2. Cool, wash down cover, add two drops of phenolphthalein and titrate with normal hydrochloric acid, adding the acid as rapidly as possible by dropping, stirring vigorously to avoid local excess of acid. When white spots appear, retard the rate of addition of acid somewhat, but continue until the pink color fades out throughout the solution for a second or two. Note the reading and ignore the return of color.

3. Repeat the procedure of paragraph 1 above, using (instead of the beaker) a one-half litre graduated flask carrying a one-hole stopper fitted with a short glass tube drawn out to a point. Cool, add slowly 4.5 cc. less acid than before, stirring vigorously. Call the number of cc. used "A". Grind up any small lumps with a glass rod slightly flattened at one end, dilute to the mark with distilled water, stopper, mix thoroughly for four or five minutes, and let settle for half an hour.

4. Pipette off a 200 cc. portion, add phenolphthalein and titrate slowly with half-normal hydrochloric acid until colorless on standing one minute. Call this additional number of cc. "B". Then per cent of available lime 2A + 2.5B.

Magnesia

The magnesia determination is made after removing silica, iron, oxide, alumina and lime. Ignite one gram, or if the magnesium content is high 0.5 gram, of the sample strongly in a platinum crucible for 15 minutes. When cool, moisten the residue and dissolve it in 1:1 hydrochloric acid, add 50 cc. of water, and filter off the silica. To filtrate add 5 cc. of hydrochloric acid, then make it slightly alkaline with ammonia, heat to boiling, and filter off the oxides of iron and aluminum. Acidify the filtrate slightly, heat to boiling, add ammonium oxalate slowly to excess, then ammonia slowly. After the first precipitate has settled, filter and wash with an ammoniacal ammonium oxalate solution. Ignite the precipitate. When cool moisten it, dissolve in hydrochloric acid, and reprecipitate. Filter off the calcium oxalate, washing with ammoniacal ammonium oxalate solution. To the filtrate add an excess of microcesmic salt and more ammonia. After the precipitate has fully formed, preferably by standing over night, filter and wash with weak ammonia. Dissolve the precipitate in a slight excess of hydrochloric acid, add one or two drops of phosphate solution and reprecipitate by adding ammonia slowly while stirring. Filter wash with weak ammonia, and ignite to constant weight. Weight of megnesium pyrophosphate × 0.3621 = weight of magnesium exide.

For rapid work the iron, aluminum and first calcium oxalate precipitate may be filtered off with the silica; also the first precipitate of magnesium phosphate may be ignited, or it may be washed slightly with dilute ammonia, then with alcohol until free from ammonia, dried on the paper at 80° C. in a small beaker, dissolved in an excess of tenth-normal (sodium hydroxide, using methyl) sulphuric acid, and titrated back with tenth-normal sodium hydroxide, using methyl orange (cc. acid — cc. alkali) × 0.00201 = grams magnesium oxide.

Crown Filler

Additional work has also been completed on specifications for Crown Filler. It seems advisable to add to them these requirements:

A limit should be placed on the amount of iron permissible,

[1] It is recommended that a bonus or a penalty of one and one-half percent of the contract price be added to or deducted from the payment for each one percent of available lime above or below the standard 85 percent. It may be desirable in some cases to make other constituents than lime subject to bonus or penalty provisions.

Locking the Door

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and from analysis of satisfactory and unsatisfactory samples of Crown Filler it is recommended that—

The amount of iron in Crown Filler shall not exceed .002% calculated as Fe203.

A definite specification for dirt or residue should be included, and the following is recommended:

The residue obtained upon washing a large sample (1 to 3 kilos) through a standard No. 80 mesh sieve with warm water shall not exceed 50 milligrams per kilogram.

In the method for acid content, under methods of analysis as given for Crown Filler, it is recommended that a large sample be taken—at least 10 grams—as the acid content is so low that accurate results cannot be obtained on such a small sample.

The test for dirt in Crown Filler is unnecessary, as any appreciable amount of dirt would be reflected in the color. The following method is recommended as a substitute for this dirt test:

Place 200 grams of Crown Filler on a No. 80 mesh sieve and wash by means of a slow stream of running water until all the calcium sulphate has been washed through the sieve. As the amount of residue in Crown Filler is very small, it is well to add another 200 grams to the same sieve and proceed as above. The sieve with the residue is dried at 212° F. and the residue finally weighed by brushing on to a balance glass—or where the residue is very small it may be washed into a small beaker, the water evaporated and the residue brushed on to a balance glass as above.

The method used for testing the iron is as follows:

Take a one-gram sample in a 100 cc. casserole and add 5 cc. of conc. HCl (iron free) and warm. Then add sufficient water in small quantities to bring the Crown Filler in solution. Usually about 25 to 30 cc. of H20 will be sufficient. As soon as the Crown Filler is in solution transfer to a 100 cc. Nessler tube. Add two drops KMNO4 n/10, or until a permanent pink remains. Then add 10 cc. 2% solution Potassium Sulphocyanide and make up to 100 cc. Compare the color with standard prepared at the same time and using a similar amount of reagents. Add to standard tube the standard iron solution—1 cc. equal to .00001 grams Fe203 until the color of both tubes is the same

Method of Analysis for Crown Filler

Crown Filler is chemically calcium sulphite with two molecules of water.

Total Moisture

Ignite one gram sample in a platinum crucible over a Maker burner until constant. The loss of weight is the total moisture.

Mechanical Moisture

Multiply the difference in weight before and after ignition; i. e., the amount of $CaSO_4$ present by 172 and divide by 136. This gives $CaSO_4 2H_2O$. Subtract this from 1.0000 grams and the difference will be the mechanical moisture.

Combined Moisture

The combined moisture is obtained by subtracting the mechanical moisture from the total moisture.

Color

Spread out a small amount of Crown Filler (dried at 212° F.) on a black paper; spread along with this a similar amount of C. P. Calcium Sulphate. Each should be pressed down with a steel spatula to give a smooth surface, and the color is then compared. If both are of the same color it will be impossible to see any line of demarcation between them.

Free Acid

Take 10- or 15-gram sample in a 250 cc. casserole and add 100 cc. distilled water. Add a few drops of Methyl Orange indicator and titrate with n/50 NaOH. The acidity is then calculated in terms of hydrochloric acid (HCl).

Residue

Place 200 grams of Crown Filler on a No. 80 mesh sieve and wash by means of a slow stream of running water until all the calcium sulphate has been washed through the sieve. As the amount of residue in Crown Filler is very small it is well to add another 200 grams to the same sieve and proceed as above. The sieve with the residue is dried at 212° F. and the residue finally weighed by brushing on to a balance glass—or where the residue is very small it may be washed into a small beaker, the water evaporated and the residue brushed on to balance glass as above.

Iron

Take a one-gram sample in a 100 cc. casserole and add 5 cc. of conc. HCl (iron free) and warm. Then add sufficient water in small quantities to bring the Crown Filler in solution. Usually about 25 to 30 cc. of H_2O will be sufficient. As soon as the Crown Filler is in solution transfer to a 100 cc. Nessler tube. Add two drops $KMNO_4$ n/10 or until a permanent pink remains. Then add 10 cc. 2% solution potassium sulphocyanide and make up to 100cc. Compare the color with standard prepared at same time and try similar amount of reagents. Add to standard tube the standard iron solution—1 cc. equal to .00001 grams of Fe203 until the color of both tubes is the same.

Vocational Education and the Superintendent*

By A. D. WOOD

The Champion Fibre Company

IT happens often that we start out to do one thing and actually do another. Columbus started out from Spain with the hope that he might discover a short route to India; he accomplished a more important thing in the discovery of America.

In reading the history of many industries, we find that by-products often prove of greater value than the main product for which the works was built.

An inventor will work for years upon some problem and secure a patent upon some device. He will employ energetic attorneys who will make the claims as broad as possible and many claims will be allowed. But the inventor may find, after his device is on the market, that a new field for its use will be developed. His original claims as set forth in his patent papers may not include the use of his invention in what proves eventually to be its most important field of usefulness. He had accomplished something greater than he planned. So the reward of our labor sometimes exceeds our expectations.

The T. A. P. P. I. boys, who act as the vocational Educational Committee of the Technical Association of the Pulp and Paper industry, conceived the idea of editing and publishing a set of text books on Pulp and Paper Making and made several claims, concerning the value of this work, to the industry at large. This was done through the paper trade publications, by letter, pamphlets, etc., and I believe that all the claims which they made, relative to the value of this organized effort, are perfectly valid, but as classes are organized and the text books put into service, we men who are watching the work and its reactions, have been astonished at some new developments. There are some claims, which might have been made, to favorably impress the paper manufacturer with the project, which were omitted for the very good reason that the Committee didn't know it was going to work out that way. This work is actually going to be of tremendous value to the superintendent. It wasn't the intention of the Committee—they didn't mean to do it—but it is working out that way. So I am going to try to tell you about it.

A song was written a few years ago entitled "School Days," and one line runs like this: "Let's take a trip on Memory's Ship" and I am going to ask you to do this, not "back to childhood days," but back to the time when you first began to assume the responsibilities which have been piling upon you ever since. How many times have you, in your years as a superintendent, wished in your innermost heart, whether you gave voice to the wish or not, that you could fill many positions in the mill with men who would attend to things as you attended to them when you were serving your apprenticeship in the mill? How many times has your mill suffered from a delay in one department or another, which you felt would have been foreseen and avoided, if you, instead of some other fellow, had been on the job in the department responsible for the delay?

Willingness to Accept Responsibility

What quality did you possess which the other man nowadays seems to lack? Wasn't it a willingness to accept responsibility? Isn't it a difficult matter today, to find a man who gives evidence of feeling as keen a sense of responsiblity as you felt when you were working your way up?

In my study and observation of men who attend classes in pulp and paper making at our plant, I came to the conclusion that a very large percentage of these men, subconsciously perhaps, seemed to welcome responsibility. And this seemed to grow with them as they progressed with the class work. The superintendents who taught the other branches of study agree with me. This reaction was felt by electricians, brick layers, pipe fitters and boiler house men as well as by the pulp and paper makers. These men are preparing to accept responsible positions, so why shouldn't they shoulder, with thanks, any additional duties and responsibilities which come their way?

Here is where the technical men fell down—they didn't claim any results like this when they asked for funds. They didn't know that this frame of mind would be a by-product of this kind of education.

I want to hammer this in. If some one came to your plant

*Address before joint meeting of the Cost Association of the Paper Industry and the American Pulp and Paper Mill Superintendents' Association, Kalamazoo, Mich., June 2, 1922.

Westinghouse

Sectional Paper Machine Drive

98-in. Pusey & Jones Fourdrinier Book Machines, 250 to 500 feet per minute.

98-in. machine started July 25 and the 166-in. Oct. 22, 1921.

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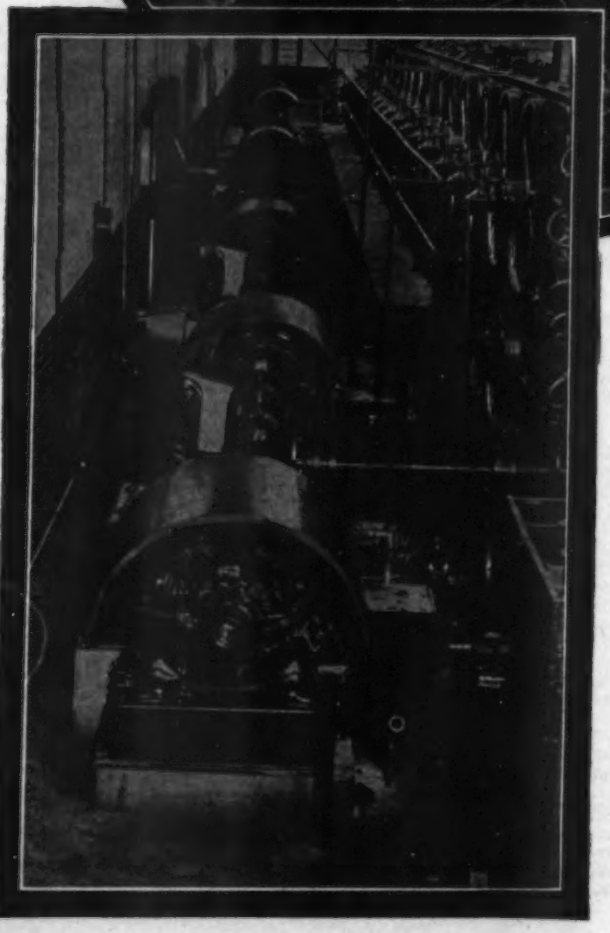

West Virginia Pulp and Paper Company

THE Westinghouse Sectional Paper Machine Drives in the Tyrone (Pa.) mill of the West Virginia Pulp and Paper Company have been in service about ten months.

The performance of this, and similar installations, recommends Westinghouse Sectional Paper Machine Drive to the consideration of all paper manufacturers.

Westinghouse Electric & Manufacturing Company
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and interviewed the man who holds the purse strings and *convinced* him that for a few hundred dollars he could change the mental attitude of the working force so that the members of that force would be inviting you to make them responsible for more details of their work, right on the job on which they are working, he'd immediately send for you and ask you what you thought about it. He certainly couldn't raise any objection if a man wanted to watch a sulphite digester as though it belonged to him personally, or if he felt a great pride when he beat the best former record for quantity and quality. But the trouble seems to be that the fellow who holds the purse strings might willingly hire a man to preach a sermon on responsibility development, but isn't willing to pay for vocational educational work of which responsibility development is a by-product.

I will not make a positive statement as to why men change their attitude toward their work as they progress with their studies. Perhaps we all like to apply the knowledge we gain, and we naturally do not object to assuming responsibility for something we know all about. It seems natural, as we know more, for us to try and find ways to express it.

You may say there are only a few men who would avail themselves of the opportunity for education, but if you have a few men here and there throughout the plant, who are accepting responsibility and working loyally as a result of vocational education, this education work will prove to be a good investment for your company. And you don't have to sermonize at all. These men will be on your side and won't know how they got there.

As I was reviewing this paper with one of our foremen who taught a class in brick laying, he asked me this question: "Have you ever thought of the influence that the class man has on the men who did not attend the classes?"

He asserted that he knew that these lessons as received were being carried through to the workmen who were not school men, and that it was making them better workmen.

Let the Superintendent Teach

Again I ask you to resume the trip upon the "Ship of Memory." As you accepted responsibilities, the acceptance of which put you in your present position and kept you there, isn't it so that you frequently saw scientific devices which you thought would be workable, and would be dividend earners for your company, but they were not "fool-proof." That is what you said about them. Then you'd continue: "It'd be alright if I was there myself or if I had some one to stay with it, but those fellows up there wouldn't take any interest in it. They don't like these new things any too well, especially if it's one of those things which will cut out a man from the crew." So you didn't have time to fool with it. Of course you could have some one come in and preach another sermon about it, and then try it out. You remember all about it, and how it actually worked. Right here I want to state that you'll be astonished to learn how hungry many of the class men are concerning a thing like this, and I might add that it was understood in our classes that when a group of our men wanted to know something about some special feature of the work, it was up to the teacher to set aside the text book and devote a session, or more if necessary, to the subject named. We did not stick to the text books anyway. We simply used them for three-quarters of an hour at each session, and so far we have been studying simple arithmetic, then the other half of the session, forty-five minutes, was given over to the description of some device with which men were working or some process with which they were familiar. If the class wanted to discuss Acid Making and the Acid Plant, we'd let the acid maker help put on the work, under the guidance of the teacher. If you want to learn a whole lot about the mill you are running, I'd suggest that you start a class like that and teach it yourself. (The Tech man also forgot to mention what a help these classes would be to the super *if he taught them.*)

But to go back to the question of these new devices which are not "fool-proof." The technical man didn't mention, did he, when he invited the trade to contribute to the Text Book fund, that the class man would be eager to work with devices which were not "fool-proof" and that he'd try and find out all about them and make an honest effort to be responsible for them, just as though he were the super?

Another trip with memory. Do you recollect saying to yourself: "Of all the responsibilities which I feel the one which weighs heaviest upon me concerns the safety of my men." Can you remember thousands of nights when you went to bed wondering if each department was in the hands of safe men? After many years of service these thoughts are doubtless uppermost in your mind, and wouldn't you rest a little easier if you knew that "Jimmy," one of the best men in the Steam class, had his eye on the Boiler House like a "pussy at the rat hole" and that, among his helpers, there were a number of fellows who were learning all they could about steam boilers? Yet the men who are asking for funds to further the work of publishing the text books never came here and suggested that Vocational Education was a reasonable, sensible method of promoting the work of Safety First. They didn't even suggest that you ask your company to "come across" so that you could get a better night's sleep. Nor did they mention that reliability development seems to be a by-product of vocational work of this kind.

Just one more thought. Sometime or other in your mill life you've had to deal with a man who was absolutely unreasonable—you recollect how just and reasonable you tried to be with him, but he was an absolutely hopeless case. You had to fire him. Costly business, firing men. Again, some of you have had the same kind of dealings with groups of men who were just as unreasonable and just as much of a nuisance. You'd think by the way some of them acted that they thought the letters U. L. on the Union Label stood for Unreasonable Lopsidedness. But you let them work on. Hell of an expense, wasn't it! I believe that Vocational Education will improve this state of affairs.

The suggestion was made at the last meeting of the Vocational Educational Committee of the T. A. P. P. I. that some money toward completing the work on the text books might be obtained through the influence of the superintendents.

All you fellows have good judgment. You all are close observers. There isn't a man here who couldn't track an elephant through four feet of snow and I think you'll accept Vocational Education as worth while.

I am not asking you to pass the hat, though if anyone present wishes to make a personal contribution it will be gratefully received. But I am asking you superintendents to interest yourselves in this work and ask your companies to support it. Here is an opportunity for you to take part in a splendid work. It's a good thing, let us push it along.

Advisory Committee for Bureau of Standards

President W. J. Raybold, of the American Paper and Pulp Association has named an Advisory Committee from the paper industry for the Paper Section, United States Bureau of Standards, for the new association year. A meeting of the committee has been called for July 10 at Washington, to discuss with Dr. J. W. Stratton, Director of the Bureau of Standards, the work now in progress and projected by the Bureau. Some of the matters under consideration were discussed by Dr. Stratton with leading members of the paper industry during the April convention in New York, but more detailed explanations of the work will be given at the Washington meeting.

Many of the committee, including the chairman, A. H. Nevius, were on last year's committee, but the entire committee for 1922-23 follows:

A. H. Nevius, Vice President, Miami Paper Company, West Carrollton, Ohio; George A. Galliver, President, American Writing Paper Co., Holyoke, Mass.; M. E. Marcuse, President, Bedford Pulp & Paper Co., Richmond, Va.; G. Frank McElwain, Vice President, Crocker-McElwain Co., Holyoke, Mass.; H. E. Fletcher, President, Fletcher Paper Co., Alpena, Mich.; R. S. Hatch, Hamersley Mfg. Co., Garfield, N. J.; Fred C. Clark, Gen. Mgr., Pejepscot Paper Co., Brunswick, Me.; Frank L. Stevens, President, Stevens & Thompson Paper Co., No. Hoosick, N. Y.; H. W. Stuart, The U. S. Paper Goods Co., Cincinnati, Ohio; Alexander Gibson, Allied Paper Mills, Kalamazoo, Mich.; W. J. Raybold, B. D. Rising Paper Co., Housatonic, Mass., Ex-Officio; Dr. Hugh P. Baker, Executive Secretary, American Paper & Pulp Association, 18 East 41st Street, New York, Ex-Officio.

The Shartle Brothers Machine Co., Middletown, O., are now building a 12"x20" pump. This pump is designed to take care of the requirements of the largest type machines in use; in fact it is a step in advance of these requirements. The pump will be built on the same general lines as the other Shartle pumps, with the exception that there will be some improvements added which they believe will even strengthen the reputation of the Shartle pump.

The Hill Clutch Co., Cleveland, O., have issued their Bulletin No. 112, which is devoted to a description with accompanying illustrations of the new Cleveland Type Hill Collar Oiling bearing furnished in all styles of standard rigid and ball and socket mountings. The company will be glad to send a copy upon request.

Manganese Bronze Beater Bars in continuous operation for 7 years show no wear whatever.

Above is an extract of a letter from Dill & Collins Co.

Manganese Bronze Beater Bars

Will outlast steel bars 5 to 1
Will not discolor paper stock
Are tougher and stronger than steel
Will not corrode
Will save money in operating costs
Tensile strength, 75,000 lbs. Yield Point, 38,000 lbs. Elongation, 20% in 2 in.

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Outwear anything on the market, by a wide margin.

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Tensile strength, 110,000 lbs. Yield point, 60,000 lbs. Elongation, 12% in 2 in.

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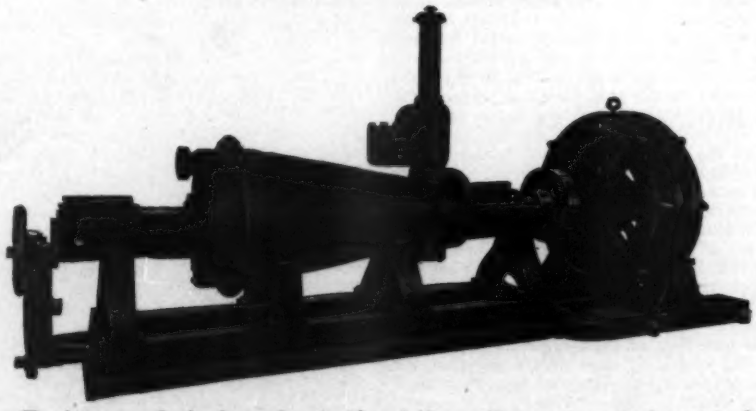

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Some Observations on the De-Inking of Old Newspapers

By SIDNEY D. WELLS
Forest Products Laboratory, Madison Wis.

Address Before the Annual Convention of the American Pulp and Paper Mill Superintendents Association, at Kalamazoo, Mich., June 2, 1922

THE use of old paper stock for the manufacture of paper is very old, and we find mention of a process by George Balthasar Illy in Denmark as early as 1695. In 1765 Dr. Jacob Christian Schaffer mentions its use in his "Papier Versuchen." In 1775 Prof. Klaproth of the University of Gottingen suggests the use of turpentine and clay for the purpose. In 1794 during the French Revolution Citizen Masson, a woman, ran an establishment for the conversion of old papers into new. In 1801 Matthias Koops established the Neckinger Mill at Bermondsey, England, to de-ink printed papers and make new paper therefrom, using dilute alkali to dissolve the varnish in the ink, clay to act as a currier, and washing to remove the carbon black; bleaching with chlorine followed to brighten the stock. Henry E. Rogers is first mentioned to use old papers in the manufacture of paper in the United States in a mill near Hartford, Conn., in 1849. During the last fifteen years, however, interest in the subject seems to have been unusually active and a great number of patents have been taken out suggesting the use of alkalies, soap, margaric acid and oleic acid in conjunction with alkalies, whiting, clay, talc, ground soapstone, earthy matter, etc.

In general, they consist of the solution of the varnish with some alkalin compound such as caustic soda, soda ash, or sodium soaps to liberate the carbon black and the holding of the particles of carbon black in colloidal suspension by preventing agglomeration with the use peptizing agents such as soaps, silicic acid, aluminum hydroxide, vegetable jellies and clay, talc, whiting, etc., containing traces or small quantities of colloidal matter. In the case of clays and talc, what value they possess as a protective colloid is due to the fact that their smallest particles are peptized by the alkalies, especially if digested at high temperatures. Only papers free from ground wood can withstand the alkalinity and temperatures commonly used, as it is well known that ground wood cannot withstand such treatment without discoloration and attempts to completely de-ink newspapers have as a rule not met with success.

Early in 1921, the Forest Products Laboratory undertook a series of comparative tests at the expense of The Paper De-Inking Co., to determine the efficiency of a process patented by them which proposed using bentonite as the peptizing agent or protective colloid in conjunction with alkalies in comparison with other methods proposed. The result of the work showed such marked improvements in the process by the use of bentonite, especially when applied to news, that it seemed desirable to publish them and discuss so far as possible the principles involved.

Bentonite is defined by the United States Geological Survey as a transported, stratified, volcanic ash that has been altered shortly after deposition. It is very fine grained and has the property of swelling in contact with water to several times its original volume into a jelly like mass which on further dilution forms colloidal solutions which will remain in suspension indefinitely in mixtures as dilute as one part of Bentonite to fifty parts of water. Like any natural product, different deposits differ considerably and the finest grained or most colloidal that have come to the writer's notice occur in Wyoming, although samples from many deposits in that state proved to be low in colloidal content. Samples freshly taken from the quarries are of a greenish yellow color but on exposure to the air become light cream. Numerous chemical analysis have been reported and considerable variation exists in sample from various sources. It is a mineral akin to kaolin although generally yielding on analysis more silica, alumina, and more magnesia and has been found to be an excellent filler for paper. It is its physical properties, however, that renders it of most value in de-inking paper, and of these, fineness is of most importance. Comparative tests with an excellent deposit of Wyoming bentonite, English china clay, and Georgia china clay in which one part of each was mixed in one hundred parts of water gave the following results on standing twenty-four hours:

	Parts remaining in suspension
Wyoming Bentonite	.78
English China Clay	.001
Georgia China Clay	.01

In de-inking printed paper and especially newspaper, it is comparatively easy to loosen the carbon black by dissolving the varnish of the printing ink by means of alkalies such as sodium carbonate or caustic soda using as little as forty pounds of sodium carbonate per ton of paper and temperatures as low as one hundred and twenty degrees Fahrenheit. Such treatment will not injure ground wood pulp and if the carbon black could be completely washed out after liberation a satisfactory material would be obtained. Unfortunately the fibres of the paper stock serve as a very effective filter in immeshing the particles of carbon and there are no means of washing in common use that will permit their complete removal without excessive losses of pulp or expenditures of time, power, and water that are prohibitive. In fact a point seems to be reached beyond which it is impossible to remove the remaining traces of ink. The problem is entirely different from the removal of soluble impurities such as cooking liquor or bleach residues and very successful methods for handling the latter impurities will not answer the purpose. With Bentonite, however, we have a substance that will pass through ordinary filters and with its enormous surface, on account of the extreme fineness of its particles, will carry the carbon black along with it. Even when washing with bentonite, however, it is better to avoid the formation of a sheet of filted fibers against the wire surface which will form a good filtering medium, and drum washers are consequently better than decker washers.

LABORATORY TESTS

In making the comparative tests referred to the semi commercial apparatus available at Madison were used. The methods followed are given below:

WASHING THE STOCK

Charging the Washer

The 25 lb. Hollander beater was half filled with water and heated by glowing in steam to a temperature of between 50 and 75°C, while from 1.5 to 2.5 lbs. of soda ash were added and allowed to dissolve. From 2 to 3¾ lbs. of ground bentonite were slowly added and beaten into colloidal solution by the action of the beater roll. If the foaming was excessive about ¼ pint of kerosene was either added to the beater or poured over the old papers, weighed out for the charge which amounted to from 25 to 37 lbs. of printed newspapers or periodicals. The paper was then added to the beater with the beater roll raised from the bed plate and water was slowly added until the beater was completely charged. Steam was then blown in to raise the temperature to between 50 and 75°C, and the papers macerated from 10 to 20 minutes.

The drum washer was then lowered and washing commenced. When it had proceeded far enough to materially reduce the apparent quantity of ink present, ten per cent of sulphite pulp, based on the weight of the old papers charged, were added to give the desired strength and facilitate the completion of the washing by rendering the stock more open. The speed of washing seemed to be directly proportional to the rate of the removal of water by the washer and anything that increased it increased the rate of washing correspondingly. When the washing had proceeded to the point where the waste water became free from ink, about 100 c. c., of sulphuric acid were added to neutralize any alkali remaining and brighten the color of the stock. The washing was continued about ten minutes when the washer was raised and

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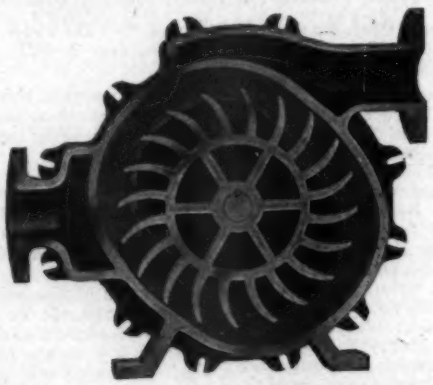

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sizing, loading, and coloring materials were added to give the type of paper desired. In the case of news the stock was simply tinted and alum added. With the book paper runs, 15 per cent of clay and 1.5 per cent of rosin size were added. The furnish was run over the Fourdrinier paper machine into machine finished paper of the same type as that from which it was made.

Yield and Water Measurements

The laboratory runs seemed to indicate that either used news, book, or bond paper could be satisfactorily washed with the help of bentonite and used in making the same type of paper. Yield determination on several runs indicated an average loss of from 9 to ten per cent. The average time for washing the news runs was one hour. Measurements on the water used indicated a rate of 3.5 gallons per minute during the washing period. The details of the several runs are given in Table 1.

MILL TRIALS

In view of the success obtained on a laboratory scale, in using bentonite for reclaiming used printed paper, Mr. O. L. E. Weber, General Manager of the Watab Paper Company, Sartell, Minn., was interested in trying the process in his mill and a series of runs were made in June, 1921.

Sorting

The conversion plant at the Watab Paper Company was located in a three story concrete and brick building of excellent construction in which there was no perceptible vibration. On the top floor was the sorting department which was only used in these runs to remove straw board and metal and fill trucks with loads of from 600 to 1,300 lbs. each of old news.

Cooking

At one end of the second floor were two cast iron beaters of 3,000 pounds rated capacity provided with sheet iron covers and vent pipes and known in the mill as cookers. Steam connections were also provided in the sides for the admission of steam to heat the contents of the beater to boiling and hold them at that point. The bars on the beater rolls were spaced about five inches apart and since there were no bed plates the bars merely served as paddles to circulate the stock and gently macerate it. The cookers emptied into a concrete chest on the first floor from which the stock was pumped to a decker beside the cookers. The liquor from the decker was returned to the cookers and the stock was washed from the decker with water into a second concrete chest. By use of the decker approximately half of the soda ash and one third of the bentonite was returned to the cooker making possible a corresponding reduction in the amounts of the two needed.

Washing

From the second concrete chest the stock was pumped to any one of the four 2,000 lbs. Jones washers equipped with four drum washers each. The drum washers on one of these, washer No. 4, were covered with a special nickel alloy wire, 80 mesh, through which it was possible to remove 146 gallons of water per minute, while with each set of four drum washers on the other washing engines which were covered with a corduroy type of copper wire, only 60 gallons per minute could be removed. The rate of washing was proportional to the rate of the removal of water, and in the case of washer No. 4, it was found possible to thoroughly wash the stock in one hour, while the other three washers took from two and one half to three hours. After washing, dilute sulphuric acid was added in the proportion of 13½ lbs. per ton of old papers. A considerable brightening of the color was effected and the stock was dumped into a third stuff chest.

Screening

The stock was screened on flat diaphragm screens and run over a thickener or decker into a fourth stuff chest from where it was run through a Jordan and over wet machines into laps of pulp which were weighed and tested for moisture in order to determine the yield. The proportion of chemical and bentonite used in the tests were as follows:

MATERIAL CHARGED

Series No.	Cook No.	Paper	Soda ash	Bentonite	Time in cooker min.	Temperature Degrees C.
1	1 to 10	3,000	150	250	30	70
2	11	2,500	100	250	30	70
2	12	2,500	50*	125	30	70

*Black liquor returned to cooker from decker in running preceding cook. Decker was not used with all other cooks.

The first series of runs consisting of 10 cookers of old newspaper stock, thirty thousand pounds of papers were used from which the following lots of pulp were obtained.

68,765 lbs. testing 28.5 per cent bone dry	19,598
14,025 lbs. testing 29.5 per cent bone dry	4,137
1,665 lbs. broken laps testing 29.5 per cent bone dry	491
Bone dry weight of pulp	24,226 lbs.

Bone dry weight of paper used = 30,000x.90 = 27,000 lbs. yield 90 per cent.

Tests to determine the volumes of wash water and the fibre, clay and ink in the same were made on runs 14 and 15 in washers 4 and 3 respectively, with the following results:

	Washer No. 4	Washer No. 3
Volume of washer	4,200 gals.	4,200 gals.
Time to fill with valve turned to washing position	28 min. 45 s.	70 min.
Rate of flow per min.	145 gals.	60 gals.
Total time washing	60 min.	2 hrs. 44 min.
Total volume of water	8,760 gals.	9,840 gals.
Fibre lost	37.9 lbs.	46.9 lbs.
Fibre lost	2.53 lbs.	3.13%
Ignited residue	49.3 lbs.	58.3 lbs.
Clay in water	58.0 lbs.	68.5 lbs.
Ink removed	3.6 lbs.	5.2 lbs.

From the results of the above tests, it appears that the loss of fibre in the washers is only between 2½ and 3½ per cent. Since a yield of only 90 per cent was obtained the remainder of the 10 per cent lost must have occurred at the wet machines or in the cooker. From experience with the solubility of ground wood papers in water and dilute alkali a loss of between 1½ and 3 per cent would be expected in the cookers and the wet machine seems to be responsible for about half of the total loss. By using the stock directly from the washers much of this loss would be avoided and a considerable saving effected.

Continuous Operation at the Watab Paper Company

As a result of the test in July, arrangements were made for continuous operation on old news. The necessary supply of old newspapers, bentonite, and soda ash were accumulated and in November, 1921, operations were commenced. It was at first attempted to obtain an output of forty tons of de-inked pulp per day. It was found, however, that the color of the stock was too dull for the grades of paper being made and the output was reduced to thirty tons per day to give more time in the washers. At this rate it was found necessary to give close attention to the washing and with the desire to keep the washers in rotation, stock insufficiently washed would occasionally be dropped. After running several months it became evident that the power consumption needed was more than it should be for the output and the quality of the washing too uncertain. A new type of washer seemed necessary that would wash the stock without the necessity of beating the stock more than was necessary for defibering the paper.

Sloping Screen Washer

In order to obtain the maximum washing with the least handling of the stock a sloping frame ten feet wide and twenty-four feet long was constructed with a slope of approximately one foot in five. Over this was stretched a discarded Fourdrinier wire and under the frame was built a wooden tank divided by a partition midway between the ends. Above the screen was hung a grid of showers spaced thirty-six inches apart and supplied with water from a main along one side which was closed by a blind flange half way from the ends. Fresh water was supplied to the lower showers and caught in the half of the tank below after passing through the stock. A centrifugal pump pumped the water from the tank to the upper showers. After passing through the stock on the upper portion of the screen, it was caught in the other half of the tank below from where it was pumped to the Jones washers. The showers were directed at the stock at an angle of about 30° to the surface of the wire and the grid was given a reciprocating motion of thirty-six inches, so that the stock was moved down the screen by the force of the showers and at the same time thoroughly washed. On the return stroke the showers merely added water and violently turned the stock over and over. The old papers were passed from the cookers to the Jones washers as usual and from the stuff chest below the washers pumped to a flow box at the top of the sloping screen washer which distributed it over its entire width. The fresh water from the lower showers washed the stock, already almost completely washed, and was then passed through the upper showers to wash the stock as it came from the Jones washers. After being used twice, it was still only slightly discolored and was used a third

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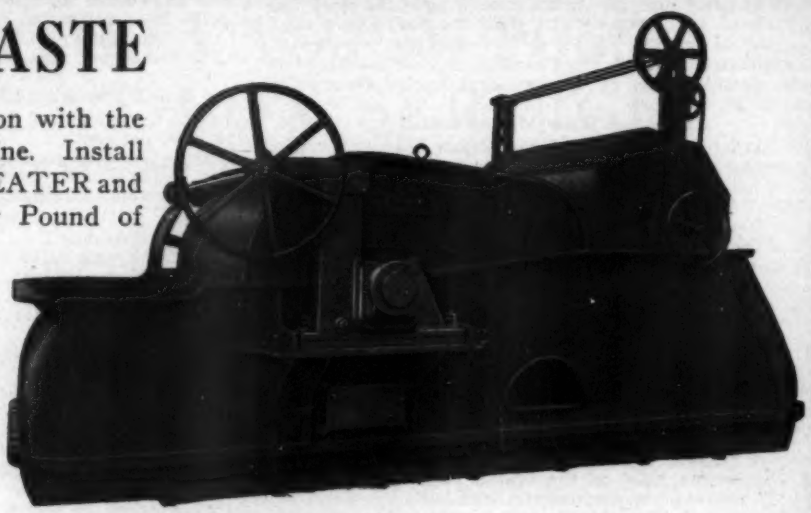

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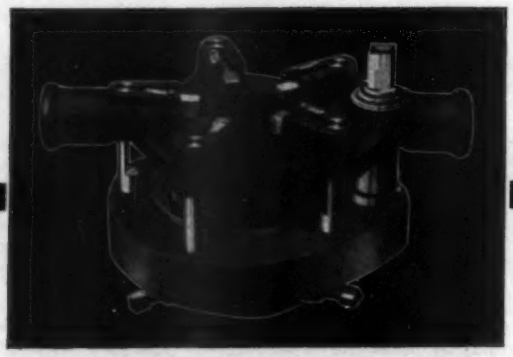

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TOLEDO, OHIO New York Office, 50 Church St.

time in the Jones washers.* The results obtained were surprising, and it was evident that the stock was completely de-inked.

It must be borne in mind, however, that the papers used were made from furnishes that were colored blue white as is customary and since the dye is not removed the washed stock was blue white and not light yellow like ground wood. For this reason proper adjustments should be made in using it and less dye used than is customary when using ground wood. The effectiveness of the washing is shown by the clay

No.	White		White
1	58%	No. 5	55%
2	53%	No. 6	63%
3	65%	No. 7	55%
4	60%	No. 8	57%

The test of 60½% white on paper run at the mill using 80% de-inked stock and 20% sulphite compares very favorably and indicates that for all practical purposes a satisfactory news sheet can be obtained.

During the trial at the Watab Paper Company since last November something over fifteen hundred tons of old newspaper stock has been de-inked using bentonite as the carrying agent. Slight changes were made from time to time and the proportion of chemicals finally used were as follows:

Old newspaper stock	2,500 lbs.
Bentonite	200 lbs.
Soda ash	40 lbs.
Hydrated lime	25 lbs.

With the sloping screen washer, it was found possible to omit the use of sulphuric acid, since the last traces of alkali were removed and with its elimination the yellowing caused by the alkali disappeared. With slight modifications in the washer, the capacity of forty tons of de-inked stock is possible and changes in the arrangement of the plant with an increase in the width of the washer of five feet would make possible an outfit of fifty tons daily.

Run No.	Old papers used—	Quality of paper	Paper charged air dry weight lbs.	Soda ash lbs.	Chemicals Clay used: Kind	Chemicals Clay used: Quantity lbs.	Sulphuric acid cubic centim'ters	Temp'ture during macera-tion °C	Washing time: Charging and mac-erating Min.	Washing time: Washing Min.	Bleaching time: Bleach used lbs.	Bleaching time: Bleaching Min.	Bleaching time: Washing Min.	Color of finished sheet
1	Wisconsin State Journal...	News	25	2.00	Bentonite	2.00	100	55	10	65	...	...	...	Fair
2	Wisconsin State Journal...	News	25	1.25	Bentonite	2.00	100	57	15	67	...	...	...	Fair
3	Wisconsin State Journal...	News	25	1.63	Bentonite	2.13	100	55	15	75	...	...	...	Bright as original
4	Wisconsin State Journal...	News	25	2.50	English China clay	2.50	100	55	20	75	...	...	...	Dull
5	Wisconsin State Journal...	News	25	2.50	Fullers earth	2.50	100	55	15	60	...	...	...	Dull
6	Ladies' Home Journal.....	Book	25	2.50	Bentonite	2.50	100	61	15	60	0.4	5	40	Bright as original
7	Ladies' Home Journal.....	Book	25	2.50	Bentonite	3.75	100	69	25	90	0.3	5	35	Bright as original
8	Miscellaneous Weeklies....	Book	32	2.50	Bentonite	3.75	100	65	20	70	0.5	30	30	Bright as original
9	Chicago Tribune	News	25	1.62	Bentonite	2.12	75	55	12	60	...	...	...	Bright as original
10	Ladies' Home Journal..... Saturday Evening Post.... Pictorial Review ..... Cosmopolitan, American and Hearst	Book	25	2.50	Bentonite	3.75	75	65	15	90	0.3	5	25	Bright as original
11	London Times and Manchester Guardian	News	25	1.62	Bentonite	2.12	70	57	10	55	...	...	...	Bright as original
12	Wisconsin State Journal...	News	30	2.00	.....	...	75	55	12	60	...	...	...	Dull
13	Wisconsin State Journal...	News	30	1.45	Wilkinite*	2.55	75	62	12	60	...	...	...	Bright as original
14	Wisconsin State Journal...	News	30	1.45	Wilkinite	2.55	75	62	12	60	...	...	...	Bright as original
15	Wisconsin State Journal...	News	30	2.00	Borax	2.00	70	62	12	60	...	...	...	Dull
16	Wisconsin State Journal...	News	30	2.00	Ivory Soap	2.00	70	62	12	60	...	...	...	Dull
17	Technical Notes	Writing	30	1.45	Bentonite	2.55	70	65	12	60	...	...	...	Bright as original

* A very colloidal Bentonite.

present in the washed pulp and the following ash tests will give a very good illustration.

	Ash
Stock after washing two hours in 2,000 pound beater with four drum washers	3.75%
Stock after washing one hour in 2,000 pound beater with four drum washers and passage over sloping screen washer	1.69%

Ash in paper after washing one hour in laboratory beater under similar conditions using 10% of various clays and bentonite:

	Ash
Bentonite	3.29%
English China Clay	3.52%
Fullers Earth	4.09%

The removal of ink with bentonite is furthermore much faster than with either china clay or fullers earth as is shown by the following Ives tint photometer readings on paper made from the three runs referred to:

	White
Bentonite	61.4%
English China Clay	58.6%
Fullers Earth	59.2%

Similar readings on fresh ground wood, and the two stocks obtained at the Watab Paper Company of which the ashes are given above follow:

	White
Ground wood	70.5%
Stock washed 2 hours with drum washer	60.7%
Stock washed one hour with drum washers and passed over sloping screen washer	66.5%

In tinting ground wood furnishes to give the customary white demanded by the trade, a certain darkening of the color occurs as is shown by the following tests on a number of typical commercial newspapers made from fresh ground and sulphite.

*A washer following the general lines of the washer described has been perfected and can be furnished by the Paper De-inking Co.

Discussion

The possibilities of a process for the recovery of old newspaper stock such as has been described are apparent to any one familiar with the paper industry. When the price paid for old paper stimulated collection, it is reported that about twenty-five thousand tons per month were collected in Chicago of which forty per cent was news. During the same period, Cleveland is reported to have handled approximately three hundred and fifty tons per day of which one hundred and fifty tons was news. In our large metropolitan centers probably twenty-five hundred tons per day were collected which would furnish a very considerable portion of our daily consumption of approximately seven thousand tons of newsprint. The source is furthermore at the place of consumption and the saving in freight is a very important item. The color requirements of the publishers at the present time are very severe and any process that does not thoroughly remove the ink cannot be successful. While considerable difficulty was encountered in meeting these requirements in the trials herein described, the results obtained as the process has been finally worked out seem to justify our belief that they can be met.

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Heavy Gearing and Friction Clutches for paper-mills, rubber-mills, tubemills, cement-mills, rolling-mills, stone quarries, and rock products, mining and coal-handling machinery, elevators and malt houses, turbines and water wheels, sugar refineries, packing houses, electric light plants, powder-mills, glass factories; cut gears and machine molded gears of all kinds.

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Special machinery built to order on modern tools at usual shop rates.

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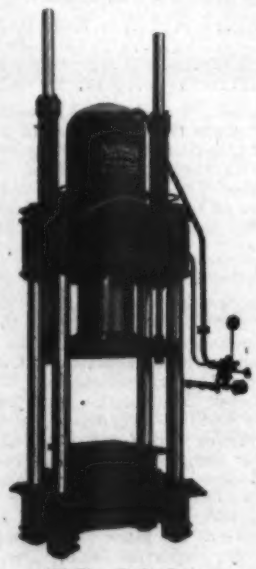

600-Ton Pulp Press

THE PRESS illustrated is typical of our improved designs, of all steel construction with the exception of the rams, which are chilled iron ground on the working surface and outside packed.

This press has pressing table 33″ wide by 46″ long, with ram stroke of 48″. It is designed for any standard working pressure up to 3500 lbs. Special sizes can be furnished to suit any requirements. These presses are equipped with Southwark two pressure three-way valves of forged body spindle type for controlling. Either the two pressure or single pressure system may be had.

The press is provided with bottom pressing table and improved drop track which does not require manual control.

We also build sulphite presses, baling presses, pumps and accumulators for the pulp trade and carry in stock a complete line of hydraulic valves, fittings and pipe.

It will pay you to have our quotations on your requirements.

SOUTHWARK FOUNDRY & MACHINE CO.

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Branch Offices: Fisher Bldg., Chicago; Swetland Bldg., Cleveland

New England

Boston, July 1.

Expectations of an advance in the price of all papers are heard in New England, fine papers and newsprint being particularly mentioned as grades that have had sufficiently strong bullish influences at work on them.

Certainly the market has been very strong on all raw materials that the paper mill uses with the single exception of woodpulp, and this latter is due to the very large shipments of pulp from Scandinavia that continue to arrive at our ports. Prices on bleached sulphite pulp of foreign origin continue to hover at 4c docks, but prices are being made delivered mills now, we understand, at close to that price so as to cut under the domestic quotation of 4½c delivered which is quoted by New England pulp mills.

Coal of course is the chief agency conducive to higher prices of paper. Prices of coal are about $7.75 to $8 gross tons on the cars at Boston or Providence, R. I., and the freight rate reduction of 10% which became effective today will not weaken values, according to the coal trade, but will merely act as a partial absorbent for the increase in prices that was about to develop.

Waste papers have been a source of surprise in view of the strength shown. Heavy waste book stock for delivery to the big book paper mills at Fitchburg, Mass., has been in exceedingly strong demand during the past month, although the keen edge of that demand has been dulled somewhat by the heavy shipments that came in from not only New England but the middle west when prices as high as $2.35 to $2.50 were paid for books and magazines delivered Fitchburg mills. Grades of waste used by the board mills have also been very firm with mixed papers selling at $10.50 to $11.50 f. o. b. Boston and folded news varying from $12 to $13. As in previous months, Michigan and other western mills have been important factors in boosting New England prices on waste papers. Soft shavings are now selling at $3.75 shipping point and old kraft papers at $1.65 f. o. b.

For the the first time this year an active demand for cotton rags developed. Shirt cuttings sold as high as 11 and 11¼c delivered Holyoke. No. 1 old white rags repacked brought over 7c per pound delivered, soft unbleached cottons sold at 9½c mills and even fancy shirt cuttings sold to some extent at 4¾c to 5c delivered, where a mill was satisfied that the samples submitted which bleached readily, were representative of a lot.

English dark cottons for roofing mills have recently sold at $1.15 on docks Boston while a special packing of dark cottons for fibre mills brought $1.30 docks.

As is well known throughout the paper mill supply trade, quite a flurry has existed in old Manila rope this past month. Mills have paid the highest prices of the year but fell short of meeting the views of some importers or rather, those who the importers represent on the other side. Sales of rope are being made at prisent at 5¾c on the docks while other business has been done previously this month at 5.90 and 5.85 for domestic packing, f. o. b. shipping point.

On July 1st the new prices on china clay go into effect. These are practically unchanged, being only three shillings per ton lower than those previously quoted. The three shilling recession was made on those clays that were not advanced on the first of the year. In the case of the latter, we understand that the price was returned to the figure prevailing before the advance on January 1.

Outing of New England Salesmen

A group of sixteen members and friends of the New England Division Salesmen's Association of the Paper Industry left Boston in the early morning Thursday, June 9, and traveled over the smoothest of highways, the famous Jerusalem Road along Massachusetts' south shore to the Scituate Country Club. Here luncheon was enjoyed, and golf in the afternoon, the party leaving for Plymouth about 5 p. m. In this historic town, Plymouth Rock and the Monuments were visited whereupon the group repaired to the Samoset House for dinner.

The short speeches, which though brief were to the point, were made by the Chairman of the Division, John E. A. Hussey, New England sales agent of the International Paper Company, Mr. H. H. Reynolds of the B. D. Rising Paper Company, O. M. Porter secretary of the Salesmen's Association and assistant secretary of the American Pulp and Paper Association and J. W. Fitzgerald of the Canadian Export Paper Company. Mr. Reynolds' optimism impressed his hearers. He left no doubt in the minds of all that he believed good business ahead for the paper industry. Newsprint he stated was enjoying the greatest demand in the history of the industry. At the suggestion of Chairman Hussey, who served as toastmaster, a telegram of good wishes was sent to Dr. Hugh P. Baker and George W. Sisson who sailed on the morrow for Europe on a tour of inspection. Mr. Fitzgerald emphasized the excellent demand for newsprint. He stated that three months hence he expected the Canadian mills would be behind the demand, and added that extremely heavy orders were being received from South Africa, Australia, and South America. A pleasant drive back to Boston under a full moon, concluded a typical New England outing.

New Kraft Mill Being Built

In a way, the biggest piece of news from New England this month is the plans that are well under way to establish a kraft paper mill at Monroe Bridge, Mass. A new company known as the Deerfield Valley Paper Company, incorporated about a month ago under the laws of Maine, will back this new undertaking. A forty ton kraft machine is being built by the Pusey & Jones Company of Wilmington, Del., while the engineering work is being handled by the Management Engineering and Development Company of Dayton, O.

The circumstances of the establishing of this new mill are rather unusual. At Monroe Bridge, Mass., there is a paper board mill having a capacity of 25 tons of board daily. This mill was entirely rebuilt in 1920, and in the new building ample space was provided for two machines, it being the intention to add a second machine later. Up the Deerfield Valley about eighteen miles from Monroe Bridge, there is a sulphate pulp mill owned by the New England Power Company. Owing to market conditions, this mill has not been very active lately, though it has a capacity of over 40 tons a day and includes some 40,000 acres of timberland, giving it a rich raw material reserve. The owners of the board mill and the pulp mills seeing a community of interest, in which the latter could supply a kraft machine located at Monroe Bridge with pulp, decided to combine their assets. The new company is unusually well financed and has energetic backing. Mr. William G. Chortess, formerly treasurer of the Monroe Bridge Paper Company, is president of the Deerfield Valley Paper Company, and A. E. Pope of Boston is vice president. The Company plans to start operations with the kraft machine on October 1st, while the board machine will continue operations as at present.

Large Development Plans for Pjepscot

The Pjepscot Paper Company, now controlled by the International Development Company, has already expended between $2,000,000 and $3,000,000 in the development of its plants at Pejepscot and Lisbon Falls, Maine. Further development is expected to call for the expenditure of a million dollars and the Topsham and Bowdoin plants are included in the completed plans.

The Pejepscot Paper Company manufactures newsprint, sulphite, and ground wood, in the four mills mentioned, and the new owners have worked out a scheme which will increase both the output and the efficiency of the plant. Three of the mills now produce an aggregate of 121 tons of newsprint weekly, the Bowdoin mill having been down recently. In the reorganization of the company, Edgar Rickard of New York became president, succeeding Julius A. B. Cowles, and Fred C. Clark became vice-president and general manager, succeeding W. W. Nearing who retires after a long period of service with the Pejepscot.

Boston Paper Trade Association Outing

A hot day but a pleasant one is the memory of the outing of the Boston Paper Trade Association which took place on June 7 at the Vesper Country Club, Lowell, Mass. All who attended left at various hours and traveled over the unsurpassed roadways north of Boston through the Fellsway to the Island in the Merrimac River where the grounds and club house of the Vesper club are located.

Some new stunts were uncorked in the sports which were run off, among them being a cigar and cigarette race, the idea being to be the first to cross an open space, reach a stack of Bull Durham, roll and light a cigarette, and return to the starting point. A ball game was played between merchants and manufacturers, and the merchants ran away with the game to the tune of a 10 to 2 score. A most enjoyable dinner was served at the club house and the day ended in the cool of evening, when the machines returned to Boston.

Rain has done hundreds of thousands of dollars damage to New England paper mill property chiefly pulpwood during the exceedingly heavy rains of June. At St. Albans, Vermont, a log boom of the Missisquoi Pulp and Paper Company, a specialty paper maker located at Sheldon Springs, broke away

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A wood tank, if attention is necessary, can be repaired by any carpenter or mechanic, while if a leak occurs in a steel tank, it means a job for an expert boiler maker.

If, after years of service, a wood tank begins to fail, it can be easily replaced by a new tank without disturbing the steel structure on which it rests. Being separate from the structure, they can readily be taken down and re-erected at a new location, without harm and with little trouble.

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LITTLEFORD Steel Smoke Stacks and Flues are ENGINEERED to suit the individual requirements of every purchaser. The design and methods employed in their erection are the results of over thirty years' experience.

Our engineering ability and experience is at your disposal for the asking.

LITTLEFORD BROS.

500 E. Pearl St., Cincinnati, O.

and 4,000 cords of wood were thrown down stream doing great damage to crops, bridges, roads, etc. The company is reported to have estimated the cost of salvage at $100,000. On the Aroostook River, in Northern Maine, it is reported that a boom of logs belonging to the Great Northern Paper Company broke away and piled on top of a lumber drive. Owing to high water, the mills of the S. D. Warren Company were forced to close for a time, and the Lincoln, Maine, mill of the Eastern Manufacturing Company had its railroad communications cut off by washouts.

Conservatism is being vindicated in these days of readjustment and in no case more vividly than that of the Eastern Manufacturing Company, the maker of the famous Systems Bond business papers, whose mills in Maine were hard hit by the depression last year. The able management is able to issue a report from the Boston offices to the effect that the company is today earning its interest charges, dividends and depreciation. The paper making end of the business is running at capacity while the pulp mill operates at about 75% of capacity. What is most important is that the production of both pulp and paper per employe is higher than at any time in the company's history, a sure sign that efficient methods are getting results.

The opposition that arose to the four cent duty on casein among New England paper mill users of this community was certainly effective. Strong urgings have been addressed to New England senators and representatives, and no less a personage than Senator Lodge has been so favorably impressed by the paper men's arguments that he has, it is understood, decided to oppose any duty on casein. It has been strongly pointed out that a duty on casein would simply increase the cost of manufacture which would be passed on to the consumer, as the domestic production would not be increased as it has been effectively shown that other methods of disposing of skim milk yield much higher returns except during the few flush milk months of the year.

Governor Baxter, of Maine, who has recently been renominated, which is equivalent to an election in Maine, has made efforts to have the Federal Government establish a Forest Experiment station in Maine to cover the New England territory. The scope of its work would be the same as the well known Laboratory in Wisconsin. The entire maine delegation is for the idea, and it will probably materialize. It is pointed out that Maine's paper industry is dependent on her forests which are diminishing out of all proportion to their growth, and Governor Baxter believes a Federal Station could give valuable advice to stay or prevent the denuding of Maine's wonderful spruce woods.

President Garret Schenck of the Great Northern Paper Company offered at a town meeting at Madison, Maine, to replace the present bridge with a new $15,000 one providing the town will contribute $3,000 which it promptly voted to do. President Schenck also announced that his company is planning extensive developments at its mill at that town, including a new abutment, new drainage pipes, water pipes and other improvements.

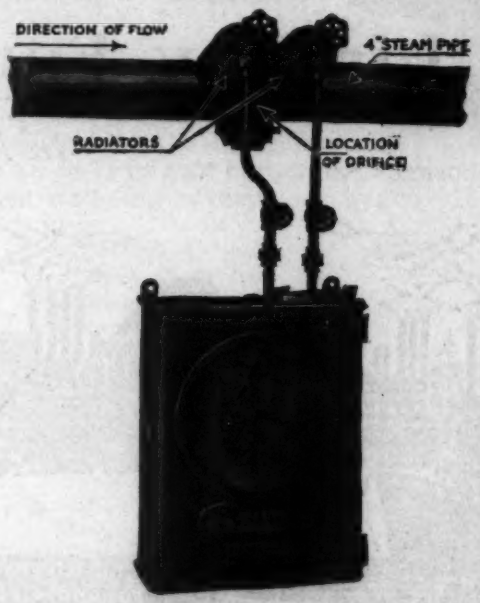
A civil suit that has aroused considerable interest in lumber and pulp wood circles is the case of Eaton vs. Sawyer in the Bangor, Maine, district court. The jury has awarded the plaintiff $12,000 damages. The action was brought over a contract by which the defendant, Frank Sawyer, of Jonesport, Maine, failed to ship pulpwood as per contract, forcing the plaintiff to go out into the open market and buy.

Eaton, Crane & Pike, famous makers of fine stationery papers, located at Pittsfield, Mass., filed papers of incorporation at the State House, Boston, this past month. The incorporation is for a capitalization of $3,500,000. The incorporators are Arthur W. Eaton, and William H. Eaton of Pittsfield, Felix Rackemann of Milton, Harrison M. Davis of Salem, Ralph Dunbar of Boston and David F. Sibley of Boston.

The Katahdin Iron Works branch of the Bangor & Aroostook Railroad in northern Maine will be abandoned, permission to do so having been granted by the Maine public utilities commission. This branch line extended from Brownsville Junction to Katahdin Iron works and was used chiefly to haul pulp wood, but most of the desirable timber in its region having been removed it has not been a paying branch for some time.

The Northwestern Paper Company paper mill, supply dealers of Commercial street, Cambridge, Mass., have opened

Bailey Fluid Meter



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This shows the Bailey Fluid Meter complete for the measurement of steam. It consists of the Monel metal orifice installed between a pair of flanges, radiators and valves tapped into the pipe on the inlet and outlet sides of the orifice and pipes connecting these to the recorder.

Bailey Fluid Meters are easily and cheaply installed as changes in piping are not required and the accuracy is guaranteed.

They are the most practical and satisfactory meters for recording and integrating the flow of steam to turbines, digesters, paper machines and other processes. Steam can be measured at any pressure and temperature, exhaust steam included.

Either pressure or temperature recorders, or both, may be added to record on the same chart as the rate of flow.

Our engineering department is ready to suggest the proper equipment for your service.

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Real Merit Placed

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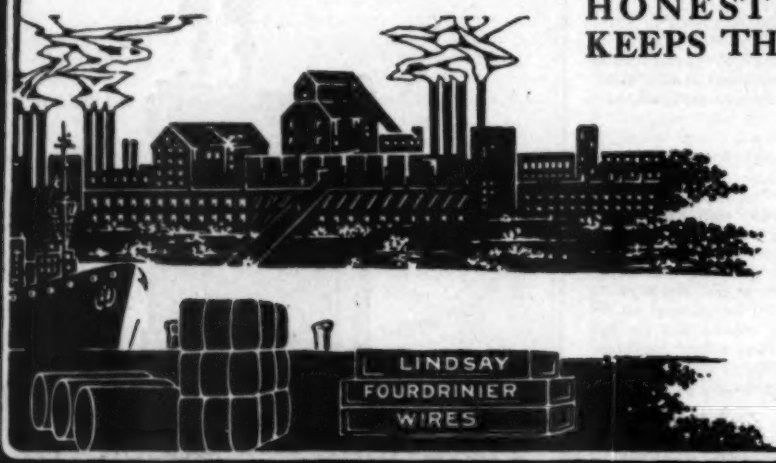
In Many Mills



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The Lindsay Wire Weaving Company

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"Ask any Papermaker"

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Dandy Rolls *Cylinder Molds*

Brass, Copper and Iron Cloth

Bank and Office Railings

WIRE SIGNS

Cheney Bigelow Wire Works

Established 1842 SPRINGFIELD, MASS.

New York offices at Room 2006 in the Park Row Building. Cotton rags, as well as the various grades of waste paper will be handled from this office. The Northwestern has had a rapid development to its present position as one of the leading paper stock houses in New England.

While imports of newsprint at Boston have been chiefly from Germany, a report is now current that large tonnages of Finnish, Swedish and Norwegian paper are to come here and to other ports as a result of an agreement by which the entire Scandinavian paper output will be sold in America through a projected syndicate, with which the name of the Canadian Export Paper Company has been associated.

Some 300 claims have been piled with the trustees of the bankrupt Kennebec and Cushnoc Paper Company of Augusta, Maine. Walter S. Wyman, receiver and one of the trustees, has been keeping the mills in operation and reports small profit at present. The replacement values of the two companies has been appraised at slightly over $1,000,000.

Improvements and additions are being made to the pulp mill of the Keyes Fibre Company of Shawmut, Maine, including an enlarged wood room and a four foot wood slasher and conveyor. A system of wood conveyors which will carry pulpwood from piles to the grinder room via the slasher room is being installed.

The New England paper trade is subscribing liberally to a memorial which will be erected at Dalton, Mass., to the late Senator W. Murray Crane of Massachusetts, who not only represented this state with honor in the U. S. Senate but increased the fame of the Crane papers all over the world.

A new company formed in Bethel, Maine, of which F. E. Pullman of Rumford is secretary and treasurer will manufacture paper umbrellas. The umbrellas will be waterproofed and made of a special paper. Present plans call for a daily production of 200 umbrellas.

The trade extends its sympathy to Charles H. Wood, president of the Edwin Butterworth Company, paper stock dealers, at the death of his daughter Mrs. Amy Beach Parks of West Somerville, Mass.

A new cylinder newsprint machine at the Madison, Maine, mill of the Great Northern Paper Company has been giving very satisfactory results according to reports from that place.

A New York importing house is about to settle on a location in Portland, Maine, for having large shipments of pulp from Scandinavia received there.

The Paper and Pulp Products Corporation of New Haven, Conn., plans to develop a plant for the de-inking of old newspapers.

Miami Valley

Dayton, July 1, 1922.

Superintendents' Meeting

Featuring the June meeting of the Miami Valley Division of the American Pulp and Paper Mill Superintendents Association, held Saturday afternoon and evening, June 17, at the beautiful suburban home of C. M. Shartle of the Shartle Brothers' Machine Company at Middletown, was the annual election of officers. The Shartle home is located about twelve miles from Dayton and is one of the most attractive residences in the valley.

Preceding the election there was an old-fashioned steak dinner served in a cabin on the Shartle estate to the superintendents and their friends. Employees of the Shartle company assisted the host in entertaining.

The meeting proper was held at 7 o'clock on the spacious veranda at the Shartle home, a short distance from the cabin.

In the absence of the chairman, A. O. Rolfe, vice-chairman, H. W. Server presided. Reports from the nominating committee composed of H. W. Server of the Miami Paper Company, L. T. Murphy of the Auglaize Paper Company at St. Mary's, Ohio, and B. M. Bishop of the Gardner-Harvey Paper Company at Middleton, Ohio, were heard. The committee stated that early in the month cards had been sent out and that returns showed that two tickets had been prepared and would be voted on. The tickets submitted to the superintendent's were A. O. Rolfe and H. W. Server for chairman; L. T. Murphy and M. B. Brooks for vice chairman; H. C.

There are reasons why Central Stations are buying Diamond Valv-in-Head Soot Blowers

The Central Stations have found that the operating economies resulting from the use of Diamond Valv-in-Head soot blowers are tremendous, including as they do:

1. LABOR—a saving of approximately 50 per cent.
2. STEAM—a saving of 40 to 50 per cent or more.
3. PIPE, VALVES and FITTINGS—a saving of 50 to 66 per cent in cost of pipe, valves and fittings.
4. MAINTENANCE—a reduction in annual charges of 25 to 50 per cent or more.
5. EFFICIENCY — greater cleanliness of boiler assured

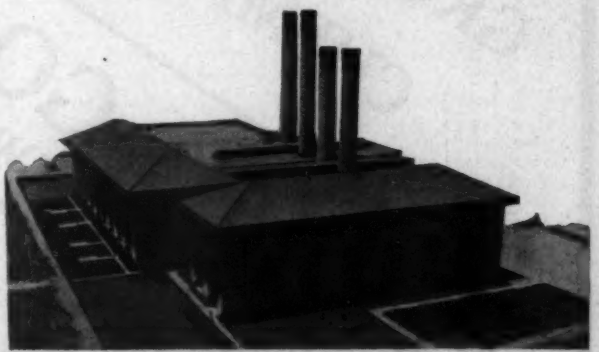
Among recent Central Station purchasers of 100 units or more may be mentioned:

Commonwealth Edison Company
Detroit Edison Company
Penn. Power and Light Company

Within the last few months orders have been received to equip over 125,000 h.p. of Central Station boilers. Diamond Valv-in-Head soot blowers pay big dividends on the investment in them.

If the central stations find that Diamond Valv-in-Head soot blowers save fuel, labor and steam, it is obvious that they can be installed profitably on every high pressure water tube boiler.

Write for Bulletin 297



DIAMOND POWER SPECIALTY CORPORATION
Detroit-Michigan
Diamond
VALV-IN-HEAD SOOT BLOWERS

Appleton

Felts & Jackets

We have for a long number of years furnished felts for some of the largest pulp, board, news and writing mills in the country.

Manufactured By

APPLETON WOOLEN MILLS

APPLETON ·· —— ·· WISCONSIN

GROUND WOOD
CHEMICAL PULPS

PERKINS-GOODWIN CO.

NEW YORK

PAPER

Martindale and B. M. Bishop for treasurer. H. W. Server was elected chairman, L. T. Murphy, vice chairman and H. D. Martindale, secretary-treasurer.

After the election, addresses were made by the new officers. They spoke principally on what they would try to do to better the association during the coming year. Later there were a number of informal talks on the benefits derived from the national convention held in Kalamazoo. It was the consensus of opinion among the superintendents that this was one of the best conventions that had been held. The men thoroughly enjoyed their trips through the mills in and about Kalamazoo.

Plans were completed for the July meeting which will be held at Piqua, Ohio. The superintendents will leave Dayton at 11 o'clock Saturday morning, July 22.

They will visit the Orr Woolen Mills at Piqua and at lunch time will be guests at the mill. It was decided at the meeting Saturday night to arrange for at least two speakers for this occasion. The meeting will be held in the afternoon at the mill. The secretary was asked to secure a speaker who would be able to talk on felts. The other subject to be assigned will be "The Care of Different Drives."

One of the guests of the evening, J. J. A. DeCew of New York, representing the Process Engineers, incorporated, Montreal, Canada, was asked for a brief address. His subject was "Paper Sizing."

There were two new members added to the association. They were Adam Ritz, of the Ohio Paper Company, and William Bottles of the Franklin Board Works.

Franklin Paper Man to Wed

Miami Valley Paper men are extending congratulations to Fred B. Zartman, general manager and treasurer of the Franklin Board and Paper company at Franklin, Ohio, upon the announcement of his engagement to Miss Julia B. McCormick, daughter of Mrs. J. O. McCormick of Xenia, Ohio. The announcement was made informally, Saturday, July 1. The wedding will be consummated in the late summer. Miss McCormick is popular in social circles in her home town. Mr. Zartman, was at one time a resident of Xenia, but has been associated with the Franklin Paper company for some time.

Boston Graphic Arts Exposition

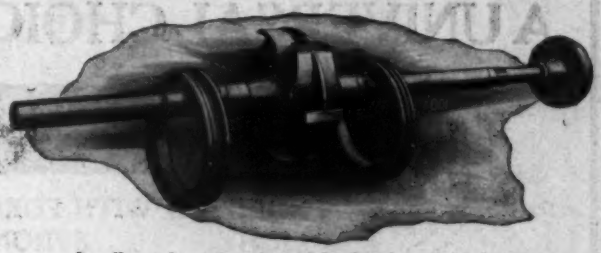
The second Graphic Arts Educational Exposition to be held in Mechanics Building, Boston, the entire week, commencing August 28 and ending September 2, 1922, promises to be a big success, broad in its educational scope and very entertaining. More than one hundred and fifty exhibitors, representing printing and all of the allied industries, are to have displays in the 105,000 square feet of exhibit space.

The Convention program, which begins on Monday, August 28th, at nine o'clock A. M., will be preceded on Sunday, the 27th, with an auto ride through parks taking in Harvard College, Institute of Technology, Radcliffe and Historic Boston. From seven until ten o'clock P. M., there will be a theatre party to hear the Boston Symphony Orchestra. Following the convention on Monday, there will be a dinner at the Copley Plaza Hotel, given by the City of Boston, to include all registered men, guests and exhibitors. During the convention on Tuesday, there will be a shopping tour for women through the large department stores and ladies specialty shops under direction of competent guides, and at four-thirty o'clock, men and women will be taken for a trip through the battle grounds of Lexington and Concord—an out-door lunch to be served on the shore of a lake—return by way of Charlestown Navy yard. The convention will open on Wednesday at nine-thirty o'clock and close at twelve. During the morning, a bathing party for women and a trip along the North Shore, including historic Salem will be had, returning home through the country, ariving in Boston at noon. At one o'clock, the ladies and men will start to sail down Boston Harbor, landing at Nantasket in time for shore dinner, cabaret, dancing and bathing; return will be made to Boston by special boats. The convention will close on Thursday. The automobile and entertainment committee will make arrangements for any private parties who wish to stay longer for trips to Plymouth, Provincetown, White Mountains, or any other part of New England.

The International Secretary has received assurances from the following roads that a reduction of fare will be made, amounting to fare and one-half for the round trip on the certificate plan:

New England Passenger Association, embracing all roads in New England territory, where the fare one way for adult amounts to 67 cents or more.

Trunk Line Association, embracing all roads in New York State (east of and including Buffalo), New Jersey, Pennsyl-



Impeller and wearing rings of De Laval special pulp pump

The De Laval High Efficiency Pulp Pump

HIGHLY efficient pumps for handling water containing pulp, rags and waste are now obtainable.

The open type impeller used in the De Laval pulp pump is shown in the accompanying photograph. The knife-like sides of the impeller blades running close to the side plates shear or cut stringy material.

This type of impeller gives practically no trouble from clogging under the most adverse conditions, and when handling materials that quickly clog closed impeller pumps.

The side plates, which surround the eye of the impeller, are removable parts, held in recesses in the pump casing and impeller. Like the impeller they are made of bronze.

The pump shaft is protected from strings, rags, etc., wrapping around it by stationary sleeves. It is also encased in bronze sleeves which extend from the impeller out through the packing glands, preventing wear by the latter upon the shaft itself.

The Da Laval pulp pump runs at speeds which permit direct connection to standard speed motors and turbines. A recent test on an 8 in. pump driven by synchronous motor showed an efficiency from wire to water of 64%, and a 10 in. pump an efficiency of 66%.

The De Laval pulp pump, like all other De Laval centrifugal pumps, is built on the split casing principle, being divided horizontally in the plane of the center line of the shaft. All internal parts are at once accessible upon lifting the casing cover, and can be removed after loosening the bearing caps. The suction and discharge connections are in the lower part of the casing and need not be disturbed.

All parts of De Laval apparatus are made to limit gages on an interchangeable basis, and replacements can be inserted by men of ordinary intelligence, using parts ordered from the factory by means of the identification symbols which will be found stamped upon each part. Special metals are used where required to withstand corrosion.

For handling water required in other paper mill applications, such as circulating pumps, service pumps, boiler feed, fire pumps, etc., etc., De Laval centrifugal pumps are superior to all others.

DE LAVAL
STEAM TURBINE COMPANY
Trenton, New Jersey

A UNIVERSAL CHOICE *for* PAPER MILLS

EQUIPPED WITH FORGED STEEL FLANGES
LIGHT STRONG DURABLE

Steel fittings made for your individual requirements. Valves for pulp lines in stock at all times.

Production Book "A" Sent Upon Request

Our engineering department will help you solve your piping requirements

AMERICAN SPIRAL PIPE WORKS

MAIN OFFICE AND WORKS
P. O. BOX 485, CHICAGO

NEW YORK OFFICE
50 CHURCH STREET

"MICHIGAN" Combination Steel and Wood Pipe

LONG DISTANCE CONVEYOR OF WATER AND PAPER STOCK IN PAPER AND PULP MILLS—Specially Adapted to Carry Sulphite, Ground Wood and "White Water"

Eighteen reasons why you should use "Michigan" combination steel and wood pipe

1—Durability of Wood Shell. 2—Sanitary. 3—20% more capacity than Cast Iron Pipe. 4—Simplicity in handling. 5—Light in weight. 6—Speed in laying. 7—Protects against freezing. 8—Not affected by Electrolysis. 9—Rigid inspection of materials. 10—Efficient construction of stave. 11—Strength of steel banding. 12—Protection of banding with asphalt coating. 13—Cannot burst under pressure. 14—Can be laid in a wet trench. 15—Short curves without specials. 16—Low installation and maintenance cost. 17—Responsibility of company. 18—Not affected by sulphur or chemical solutions.

THE MICHIGAN PIPE COMPANY

Dept. 17 BAY CITY, MICHIGAN

New York City, N. Y.....17 East 42nd St.
Oklahoma City, Okla.....105 West 16th St.
Chicago, Ill.....Leiter Bldg., 15 East Van Buren St.
Boston, Mass.....Room 737, Oliver Bldg.
Cleveland, Ohio.....919 Ulmer Bldg.
Chattanooga, Tenn.....702 James Bldg.
Philadelphia, Pa.....318 Widener Bldg.
Pittsburgh, Pa.....323 Fulton Bldg.

"Steel for Strength—Wood for Durability"

vania (east of and including Erie, Oil City and Pittsburgh), Delaware, Maryland, District of Columbia, Virginia and West Virginia (east of and including Wheeling, Parkersburg and Norfolk).

Central Passenger Association, which includes practically all territory west of Buffalo, Pittsburgh and Wheeling to and including Chicago and St. Louis and north of the Ohio River.

Canadian Passenger Association, Eastern lines embracing all territory in that association in Canada east of and including Armstrong, Port Arthur and Sault Ste. Marie, Ont.

All tickets will be on sale from August 24 to 30, and must be validated by the signature of the International Secretary and special agent of the carriers on August 30 or 31. Those leaving before August 30 or arriving later than August 31 cannot secure the reduced fare. Tickets sold in the New England and Canadian Passenger Association territories will be good for return journey up to and including September 7. Those traveling on roads in Central Passenger Association and Trunk Line Association territories will have until September 6 to start on return journey.

A delegation of fifteen members of the Board of Directors of the Boston Graphic Arts Exposition and Past Presidents of the Boston Club of Printing House Craftsmen, visited Washington and through their spokesman, Mr. William H. McMasters, representing the City of Boston and the Craftsmen, invited President Warren G. Harding to open and attend the Convention. Mr. McMasters told President Harding that he had received a radiogram from Benjamin Franklin from Mount Olympus commanding President Harding to appear at the Boston Graphic Arts Exposition. The President then stated that he would give the invitation serious and sympathetic consideration and that he would surely be at the opening of the Exposition if official duties did not interfere, as he was a real craftsman and printer.

National Safety Council Congress

The program of the Eleventh Annual Safety Congress of the National Safety Council at Detroit August 28 to September 1 is now complete. On July 15, a printed copy of the entire week's sessions, together with a formal invitation from the Detroit Safety Council and supplemented by a personal letter from President Arthur H. Young, calling attention to the points of greatest interest during the five-day program will be sent to 15,000 executive and safety men representing supervision over six million and more workers in the United States and Canada.

Indications now are that the 1922 Safety Convention will be the largest and most complete in the history of the National Safety Council. Never before in the history of the organization has response to invitations to participate in the Annual Safety Congress been so spontaneous. Public officials, industrial executives, well known authorities in research, science and education, have volunteered to appear on the programs to do their bit for national safety.

All meetings will be held in the New Cass Technical High School which has just been completed as one of the finest educational institutions of its kind in the country. The main auditorium will accomodate more than 3,000 persons. Other commodious facilities for sectional and committee meetings are included in the same building.

Paper and Pulp Section Program

Chairman, W. A. Gleason, Safety Director, Hammermill Paper Company, Erie, Pa.

Vice-Chairman, Adam Wilkinson, American Writing Paper Company, Holyoke, Mass.

Secretary, Miss Emilie Raub, Dill & Collins Company, Philadelphia, Pa.

FIRST SESSION

Tuesday Morning, August 29, 9:30 o'clock Program

I. Report of Chairman.
II. Report of Secretary.
III. Reports of Committees.
IV. Appointment of Nominating Committee.
V. Addresses.

1. Human Relatives in Industry, Fred H. Rindge, Jr., International Committee, Y. M. C. A., New York City.
2. The Goggle Problem in a Paper Mill, Raymond A. Steffen, Champion Coated Paper Company, Hamilton, Ohio.
3. Safety in the Wood Room, Frank A. Drumb, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

SECOND SESSION

1. The Foreman and his Responsibility for Employees under his Supervision, Adam Wilkinson, Labor Commissioner, American Writing Paper Company, Holyoke, Mass.
2. Accident Prevention from the Foreman's Viewpoint, Edward Preville, Kimberly-Clark Co., Neenah, Wis.

Our Best Labor-Saving Device

Writing us recently the president of the Kalamazoo Vegetable Parchment Co. said, "We appreciate very much the receipt of your catalog, as it gives us a good many ideas which we will undoubtedly incorporate into our new mill.

"We are mighty glad to know that you make other things beside locomotive cranes, one of which we purchased from you some years ago, and which we have found in every respect the best labor-saving device that we have about our entire plant."

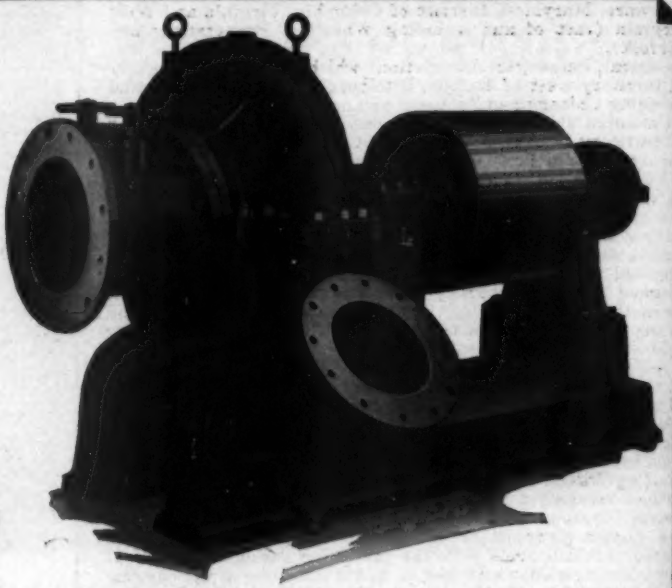
If you are interested in the handling of materials we want to remind you that Brownhoist is also interested in this subject. Over 40 years of engineering and crane building experience can be yours on any handling subject. And perhaps we can give you some valuable information, as we did the above company.

The Brown Hoisting Machinery Co.
Cleveland, Ohio

Branch offices, New York, Pittsburgh, Chicago, San Francisco and New Orleans

BROWNHOIST

"Buffalo"



Divided Casing
Paper Stock
PUMPS

Have filler piece attached to suction, cast on bevel, permitting removal of upper half of casing without breaking gasket or disturbing piping connections.

Casing is mounted directly on base, not overhung—stuffing box is extra long and gland is water sealed. Discharge is 45 degrees up from horizontal.

BUFFALO STEAM PUMP CO.
Buffalo, N. Y.

"Buffalo"

DRYJECTORS

You will want to know about the benefits of the Dryjector System of Moisture absorption when you learn that there are no pipes between the dryers, that the nozzles are adjustable to dry equally from front to back, and that no hot air is blown out at the front of the machine.

BUFFALO FORGE COMPANY
Buffalo, N. Y.

3. Address, Dr. Hugh P. Baker, Secretary-Treasurer, American Paper and Pulp Association, New York City.

Practically all available space is taken for the safety exhibit which will be held in a large hall immediately adjoining the main auditorium.

Special round trip rates to Detroit amounting to a fare and a quarter of the regular ticket price, and a fare and a fifth for extreme distances, have been granted by all of the railroads in the U. S. and Canada. A certificate from the headquarters office of the National Safety Council, 168 N. Michigan Ave., Chicago, and signed by the user for himself and family is all that is necessary.

Technical Photographers Form Society

A new organization, to be known as the Technical Photographic and Microscopical Society, has been recently formed by a group of men interested in technical photography in the paper, rubber, textile, leather, explosive and other industries.

The objects of the society as set forth in the proposed constitution and by-laws of the organization are as follows: (1) To stimulate interest in the science of technical photography and microscopy; (2) to provide means for the interchange of ideas among its members, and (3) to encourage original investigation and the development of technical photography.

Formal organization of the society was completed at a luncheon meeting at the Hotel Astor in New York on June 14, which was attended by upwards of fifty members and guests. James McDowell, president of the society, presided, and representatives were present from the Eastman Kodak Company, Western Electric Company, U. S. Bureau of Standards, E. I. du Pont de Nemours Company, and various research and testing laboratories connected with the textile, paper, rubber, leather, metal and paint industries. John H. Graff, of the research department of the Brown Company, paper and pulp manufacturers of Berlin, N. H., made an address to the gathering in which he referred to the growing necessity of photography as a tool of industry.

Thomas J. Keenan, of 251 West Nineteenth street, New York, is secretary of the society, and an invitation is extended to all technical photographers to become members of the society.

New Secretary for Cardboard, Glazed and Fancy and Gummed Paper Manufacturers' Associations

Jacob Erichsen has been made secretary of the Cardboard, Glazed and Fancy and Gummed Paper Manufacturers Associations, suceeding O. M. Porter, who has become secretary of the Pulp Manufacturers Association, in addition to his other duties as assistant secretary of the American Paper and Pulp Association and of the Woodlands Section of that association.

The change was made in order to permit more attention being given to the affairs of the three associations which have been handled by Mr. Porter, and to give Mr. Porter more time for his duties with the American association and the raw materials end of the industry. Under Mr. Porter's charge the three associations showed such possibilities of development, that it was deemed best to bring an additional secretary into the industry to further promote the interests of the three organizations.

Although Mr. Erichsen makes no pretense of being an experienced trade association executive, his business experience justified the belief that he would be able to do effective work in the paper industry. A Norwegian by birth, he has traveled extensively in Europe, South America, India, Africa and Australia.

Mr. Erichsen in 1914-15 was traveling representative for Norwegian publishers, establishing branches in England, Sweden, Denmark, Germany and the United States after which he was placed in charge of imports of American, English, French and Germany machinery for the biggest importing firm of its kind in Norway. He came to the United States in 1918 to open branch offices here and in South America for a Norwegian foreign trade company, from which he has severed his connection just recently.

Reorganization of Pulp Manufacturers' Association

A reorganization of the Pulp Manufacturers Association, forced by the unfavorable manufacturing and financial conditions of the year and more of depression, in which the element of foreign competition had no small part, has resulted in this association being brought for the time being under the wing of the American Paper and Pulp Association. O. M. Porter, Assistant Secretary of the American Paper and Pulp Association, has become Secretary of the Pulp Manufacturers

WAUSAU SULPHATE FIBRE CO.
MOSINEE, WISCONSIN
TRADE MARK
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Cut down *excessive* wrapping paper investment. Why carry two wrapping paper lines for one wrapping paper *purpose?*

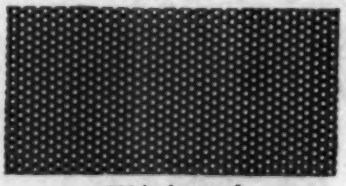
MOSINEE

presents a perfect wrapping paper, weight and strength for each wrapping purpose. Made in all weights from 15 pounds to 100 pounds basis. The one complete, standardized and economical line of wrapping paper sold.

Mosinee Kraft

"The Wrapper that Delivers the Goods"

Perforated Metal Screens for Pulp and Paper Mills



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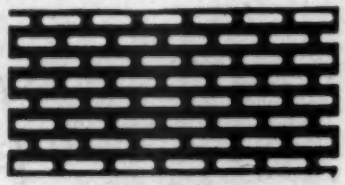
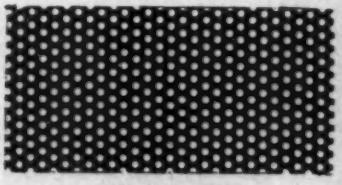


3/16 x 3/8" Slots



3/32 inch round

Steel, Copper, Brass, Bronze and other alloys punched for Centrifugal and Rotary Screens, Pulp Washers, Drainer Bottoms, Filter Plates, etc.

CHARLES MUNDT & SONS 57-65 Fairmount Avenue, Jersey City, N. J.

Manufacture of Pulp and Paper in Five Volumes

Being prepared by the Joint Committee on Vocational Education of the Pulp and Paper Industry.

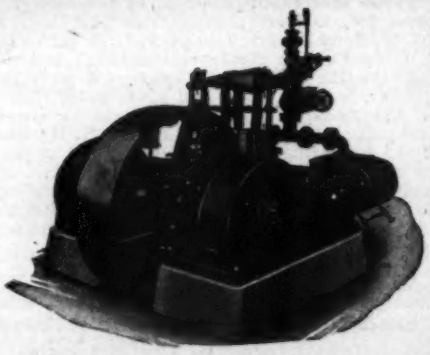
Volumes I, II and III now issued.

Volumes IV and V are expected during the year.

The work is adapted to the classroom, to home study and for use as a reference work. Every firm and individual connected with the industry or interested in the pulp and paper business should own one of these sets.

The volumes issued are on sale at $5.00 a volume and orders should be placed with the Technical Association of the Pulp and Paper Industry, 18 East 41st Street, New York, N. Y.

BROWNELL



Your production depends on your engine. Economically you can have only the best. And the safety of your expensive paper machine demands caretul selection of the engine drive.

Brownell Variable Speed Engines were the first in the field. Their consistent, reliable operation is a by-word in many plants. A patented safety device protects your plant.

THE BROWNELL COMPANY
Dayton, Ohio, U. S. A.
Established 1855

VARIABLE SPEED **ENGINES**

WE-FU-GO AND SCAIFE WATER

PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES

WM. B. SCAIFE & SONS CO., PITTSBURGH, PA.

Association, and will co-ordinate its work with that of the Woodlands Section, of which he is also Secretary. The close relation between the Pulp Manufacturers Association, and the Woodlands Section of the American Paper and Pulp Association, will, it is expected, be a step to the advantage of each group.

The retirement of H. H. Bishop, as Secretary of the Pulp Manufacturers, takes the dean of the paper association secretaries out of the industry. The change was only made after a long series of conferences in which Mr. Bishop's advice as to the method of continuing the work of the Pulp Manufacturers Association was largely followed. Under the new arrangements, the Pulp Manufacturers Association will retain its identity and individuality, but considerable saving in overhead will be effected, until such time as the association can return to its old plan of maintaining separate offices and office force.

Mr. Porter will continue as assistant to Dr. Baker, in addition to his new duties with the pulp manufacturers, but his attention will be largely devoted to the problems of the raw materials of the paper industry.

Paper Mill Workers to be Trained by Mail

The effort by the paper industry of the United States and Canada to train its employes for promotion, as well as for more efficient performance of their duties has taken another step forward, with the organization of correspondence courses on both sides of the international border. Courses for paper mill employees will be handled on the United States side of the border by the University of Wisconsin, and for Canada by the Canadian Correspondence College, Gardenvale, Quebec, sponsored by leaders in the Canadian paper industry.

The two courses are being organized with the co-operation of the Canadian Pulp and Paper Association, and the Technical Association of the Pulp and Paper Industry, the technical organization of the American Paper and Pulp Association, for the two countries. Governmental aid is to be given the American course as well, for the work to be given by the University of Wisconsin will be with the co-operation of the United States Forest Products Laboratory.

The paper industry has just completed the first three of the five volume series of text books for training of paper and pulp mill employes, at a cost of over $40,000 for the preparation and editing alone of these books. Several states have initiated special class instruction of mill employees through university extension departments, Massachusetts having been the first to hold actual classes through co-operation with mill officials. Wisconsin has also begun class instruction, but New York, with more mills than any other state in the union has apparently been unable to take up this work.

The State College of Forestry at Syracuse University, which has a paper mill department, has informed R. S. Kellogg, Secretary of the New Print Service Bureau, Secretary of the joint American-Canadian committee which has charge of vocational education in the industry, that it cannot undertake this work, either through its extension service or paper mill department. New York, therefore, will for the present be forced to depend upon the correspondence courses furnished from Wisconsin, and to do without actual class instruction under state auspices.

N. Y. S. Forests to be Visited by Canadian Foresters

The forests of New York State, which leads the nation in the actual reforestation of its cut over lands, will be visited by the foresters of the Canadian paper manufacturers the middle of July, when the Woodlands Section of the Canadian Pulp and Paper Association will make an automobile tour of northern New York, ending at Saratoga, Thursday, July 20.

The paper mill foresters of the United States, represented by the Woodlands Section of the American Paper and Pulp Association have been invited by the Canadians to make the automobile trip also.

The trip will be chiefly a tour to study the practical reforestation under way in New York State, in which the American paper industry has taken an active leadership. The American manufacturers have a technical forester for their executive officer in Dr. Hugh P. Baker, formerly dean of the New York State College of Forestry, and the secretary of the Woodlands Section, O. M. Porter, was also secured from the faculty of the State Forestry School. The New York reforestation campaign is taken as a model in the national legislation being asked for forestry by the American Newspaper Publishers Association, the American Paper and Pulp Association, the American Forestry Association and similar organizations. The Snell bill, introduced and being pressed by these associations, was sponsored by B. H. Snell of Potsdam,

SOLVAY
STANDARD IN SODA SINCE 1881

SOLVAY ALKALI

SODA ASH 58%
Contains 99 + %
Sodium Carbonate

CAUSTIC SODA 76%
Contains 97 + %
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TRADE MARK
REG. U. S. PATENT OFFICE

Crown Filler
for
Paper Manufacture

Manufactured by

The Solvay Process Company

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9 State St., BOSTON 625 Book Bldg., DETROIT
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THE WATERBURY FELT CO.

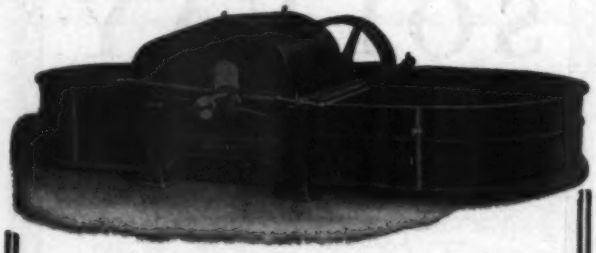
SKANEATELES FALLS

New York

FELTS and JACKETS

Top and Bottom Wet Felts for board machines, with all the qualities requisite to insure long life and continuous production.

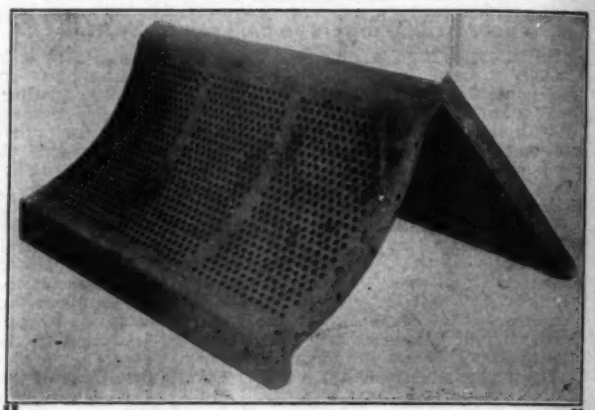
They Satisfy



"Dayton" Beating Engines are Built for Heavy Duty

Dayton Beater and Hoist Co.

DAYTON, OHIO



Because there are no moving parts this is a very simple but very efficient device. Patent No. 1,271,426 issued to Mr. Brownell Buehler, July 2nd, 1918.

The Shartle Continuous Beater Company

MIDDLETOWN, OHIO

STOWE & WOODWARD CO.

Newton Upper Falls, Mass.

Makers of Rubber Covered Rolls

Maximum Resiliency WITH Minimum Softness

Long Life

N. Y., who askes the nation to promote the practice of forestry in other states as it is now being developed in New York.

The Canadian visitors will leave Montreal by motor July 17, visiting the Delaware & Hudson plantations the first day, and on July 18 visiting the New York plantations in the vicinity of Lake Clear, Saranac and Placid Lakes, and the operations of the Oval Wood Dish Company at Tupper Lake.

The Pruyn woods operations between Newcomb and Chestertown will be visited on July 19, and the last day, July 20, will be devoted to the state nurseries near Saratoga.

Southern Pulp and Paper Co. Incorporates

The Southwest Pulp and Paper Company, which proposes to build a large pulp and paper mill three and one-half miles south of Monroe, La., has completed its organization, and has been incorporated under the laws of Delaware, with an authorized capital stock of $1,000,000 8 per cent preferred stock and $1,500,000 common stock divided into 150,000 shares. The officers and directors of the company are: Joseph G. Mayo, of Norwich, Conn., president and managing director; M. J. Leahy, New York City, secretary and treasurer; J. E. Nedin, of Wilmington, Del., and Charles V. James, of Brown & James, attorneys, of Norwich, Conn. The engineers are Stebbins Engineering and Construction Company of Watertown, N. Y.

Mr. Medin was formerly technical manager of Jessup & Moore of Wilmington, and also was recently general manager of the Howland Pulp and Paper Company of Howland, Me. Mr. Mayo was formerly general manager of the Southern Paper Company at Moss Point, Miss., and also former president and general manager of the Ironsides Board Corporation of Norwich, Conn. He has planned and constructed, as well as operated, various pulp and paper mills of various types in the East and Canada and on the Pacific Coast. He is supported in his undertaking at Monroe by two executives of the pulp and paper mill at Moss Point.

Blaney Again to Head Eddy Paper Company

Charles A. Blaney of Kalamazoo, Mich., was re-elected president of the Eddy Paper company, Three Rivers and White Pigeon, at the annual meeting of the stockholders on June 21st, at the general offices of the concern. The other officers are: Vice president, A. L. Pratt, Kalamazoo; secretary, Howard H. Buckhout, Kalamazoo; treasurer, George F. Wolf, Three Rivers; general manager, A. B. Thomas, Three Rivers.

The board of directors, named at the stockholders' session, are: E. S. Rankin, Lewis Kirby, H. L. Vanderhorst, H. H. Buckhout, Arthur L. Pratt, Clare H. Stearns, Charles A. Blaney, Kalamazoo; Oscar Gumbinsky, Harry Gumbinsky, Chicago; Geo. T. Wolf, Three Rivers, and Charles E. Nelson, Otsego. Clare H. Stearns represents the estate of Frank H. Milham and Noah Bryant on the board.

The executive committee is composed of President Blaney and Mr. Nelson and Oscar Gumbinsky.

Interlock Electric Drives for Four Machines

During the last month, the Harland Engineering Company, Montreal, Canada, booked orders for four of their Interlock Sectional Electric Drives for paper machines. They are as follows:

The Belgian Industrial Company, Ltd., Shawinigan Falls, P. Q., drive for one 230 inch, 750 f. p. m. news machine; The Provincial Paper Mills, Ltd., Toronto, for their Port Arthur Mill, one drive for one 146 inch, 100-500 f. p. m. book and bond machine; St. Lawrence Pulp and Paper Company, Ltd., Three Rivers, P. Q., two drives for 166 inch, 600-1000 f. m. p. high speed news print machines.

Michigan Pulp Mill Sold

The unfinished pulp mill at Ontonagom, Michigan, erected during the period of high prices, but which was left incomplete when the war time market broke, was sold by a referee in bankruptcy for a United States court in Wisconsin.

The property, which cost over $700,000.00, was bid in by W. B. Van Allen of Carthage, New York, on behalf of New York and New England creditors of the Northern Fibre Co., its original owners. The price was $102,000.00, less than one-seventh of the amount that the Northern Fibre Co., spent on the property.

The plans of the new owners for the disposal of the property are still incomplete, but it is understood that there is a possibility that the plant will be changed from a pulp mill to a paper mill, although this action may be delayed.

SCREEN PLATES *and* DANDY ROLLS

Watermarking a Specialty

Central Manufacturing Co.

The Quick Service House

KALAMAZOO MICHIGAN

Remember

WM. A. HARDY & SONS

FITCHBURG, MASS.

Originators and Oldest Manufacturers

OF THE

Cast Bronze Screen Plate

ALSO SPECIALIZE IN

Acid Resisting Digester Parts

UNION SCREEN PLATE CO.

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UNION BRONZE SCREEN PLATES

(Best phosphorized Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

The Witham Screen Plate Fastener, Patented

THE ORIGINAL THE BEST

Ticonderoga Machine Works

TICONDEROGA, N. Y., U. S. A.

MANUFACTURERS OF

WARREN IMPROVED CALENDER DOCTORS

With Flexible Blades, Universal Adjustment and Control
(PATENTED)

WARREN IMPROVED PATENT DOUBLE DRUM WINDERS

Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties

SEND FOR OUR BULLETIN

RETURN TUBULAR LOCOMOTIVE BOILERS WATER TUBE SCOTCH MARINE

A LARGE STOCK OF HIGH-GRADE BOILERS OF PRACTICALLY ALL SIZES, TYPES AND MAKES, TAKEN OVER FROM DU PONT CHEMICAL COMPANY'S AND OTHER PLANTS WITH PRODUCTION RECORDS — RECONDITIONED, OFFERED SUBJECT TO ANY INSPECTION, AVAILABLE NOW!

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Is Revolutionizing the Whole Paper Making Industry

If your Paper Machines are not equipped with Press Rolls of BARRE GRANITE you are not getting the results that you should get, for it is a recognized fact that granite rolls are much superior to any others and Barre Granite the best of all. Let us tell you about them.

Jones Brothers Company

BARRE, VT. BOSTON, MASS.

WYCKOFF WOOD PIPE

PRESSURE PIPE THAT NEVER BURSTS.
Built in sizes 1 inch to 48 inches.

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.

The Pipe of Service

DURABLE—ECONOMICAL—EASY TO INSTALL

Built of selected Canadian White Pine, Wyckoff Wood Pipe is wound with steel bands whose tensile strength is 58,000 to 65,000 lbs. per square inch. The experienced engineer selects a pipe of proven dependability. Wyckoff Wood Pipe, during the past 65 years, has built a reputation that stands the keenest competition. It has been, during this time, the choice of the largest pipe users in the world. We also manufacture a high grade underground steam pipe casing.

Write today for catalog and prices

A. Wyckoff & Son Company

1855 Elmira, N. Y., U. S. A. 1920

Contract Let for New Paper Mill of Parchment Co.

The immediate erection of a $500,000 two-machine mill by the Kalamazoo Vegetable Parchment Co. was insured recently when Jacob Kindleberger, president of the company, awarded the contract for construction to Henry L. Vanderhorst of Kalamazoo, Mich.

The plant when completed will be one of the finest of its kind in America and have a daily output of 120 tons of high grade papers. The most modern methods of production will be employed.

In addition to the award for the general contract, the power piping, plumbing, heating and sprinkling contracts have been awarded to the Wheeler-Blaney Co., of Kalamazoo. Orders have been placed so far for over a half million dollars worth of mechanical equipment and power equipment.

All architectural and engineering details are being handled by Billingham & Cobb, of Kalamazoo.

William Eibel, formerly treasurer and general manager of the Rhinelander Paper Co. is now the general manager and treasurer of the Peshtigo Paper Co., Peshtigo, Wisconsin.

At the recent directors meeting, the following officers were elected: J. G. Southerland, president; C. A. Goodman, vice-president; Wm. Eibel, treas. and gen'l. mgr., and E. J. B. Schurbring, secretary.

The properties of the former paper company and the fibre company were transferred to the Peshtigo Paper Co.

New construction work will commence immediately under the supervision of the Management Engineering and Development Co., of Dayton, Ohio. The company already has two paper machines and plans are under way to install a third machine to use the entire output of the sulphite mill.

It is reported that excavation work for the new mill at Menasha, Wisc., which will be known as the Valley Paper Mills, will begin shortly. Mr. Edward Wittengel of Appleton, who is the architect, has been authorized to award contracts for excavating, foundation walls and side tracks.

The new mill is to be located on the company's site in West Menasha, west of the Blair Spring Road, formerly the H. H. Held property. The building itself will be 610 ft., in length and its width will vary to accomodate machine installation.

The company will specialize in the manufacture of glassine paper and kindred lines and room is also to be provided for an up-to-date printing department.

For the first time in the history of west North Carolina, paper pulp has been manufactured into the finished paper product. The paper mill of the Champion Fibre Co., Canton, North Carolina, on Thursday, June 20, produced the first finished paper in a well equipped finishing plant that has been under construction for some time. Kraft paper is being produced.

It is reported that the company plans to start work soon upon the large order for U. S. postal card stock secured on a contract some time ago.

It is reported that a paper mill on the Pacific Coast is to be established by Wisconsin and Michigan men. The company will be known as the Westminster Paper Mills Co., Ltd., and will be located at New Westminster, B. C., 14 miles from Vancouver. John J. Herb, formerly general superintendent of the Hoskin-Morainville Paper Co., Menominee, Michigan and A. M. Onkles, formerly of Marinette, are the incorporators with a capital stock of $250,000.00. One machine will be installed and operations will start in October.

Rates on newsprint paper moving from Oregon and Washington mills to points in Oklahoma, Texas and Colorado points will be reduced by trans-continental railroad lines as soon as tariffs can be issued, according to announcement received by the freight department of the Southern Pacific Railway company. Rates on newsprint will be reduced from $1.25 to 87 cents to Texas and Oklahoma and from 94c to 79c to Colorado points. Similar reductions will be made on shipments of wrapping paper.

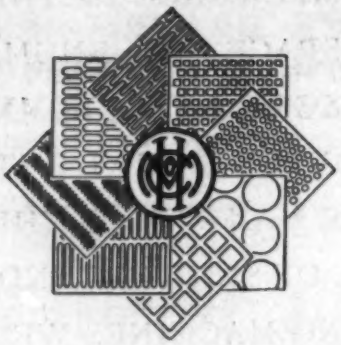
Net assets of the Mullen Bros. Paper Co., and of the E. A. Graham dock property, on June 1, were $71,486.48, according to a statement sent to creditors by the Farmers and Merchants National Bank of Benton Harbor, the receiver. Discontinuance of business was ordered on May 22, pending an accounting by the receiver. The statement announces that the receiver has now been given authority to continue the sale of manufactured products and the collection of receivables.

IT IS IMPOSSIBLE IN THIS LIMITED SPACE TO ENUMERATE THE EXCELLENCE OF MECHANICAL DETAILS THAT ENTER INTO THE MAKE-UP OF THE WIDE RANGE OF SLITTING AND ROLL-WINDING MACHINES WE MANUFACTURE.

THERE IS JUST SPACE ENOUGH TO PERMIT US TO STATE EMPHATICALLY THAT AMONG THE MANY TYPES WE BUILD THERE IS A CAMACHINE EXACTLY SUITED TO YOUR NEEDS.

ADVISE US AS TO WHAT THESE REQUIREMENTS ARE AND WE WILL SEND YOU ALL THE INFORMATION AND DETAILS AND BY A THIRTY-DAY FREE TRIAL OF THE MACHINE IN YOUR PLANT DEMONSTRATE WHAT A VITAL FACTOR IT IS IN SAVING LABOR COST AND WASTE BY THE PRODUCTION OF PERFECTLY FORMED ROLLS.

CAMERON MACHINE CO.
61 POPLAR STREET
BROOKLYN, N. Y.



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in all metals for pulp and paper mills

Elevator Buckets (Plain and Perforated)

Conveyor Flights and Trough

General Sheet and Light Structural Work

Light and Heavy Steel Plate Construction

Write for perforated metal handbook

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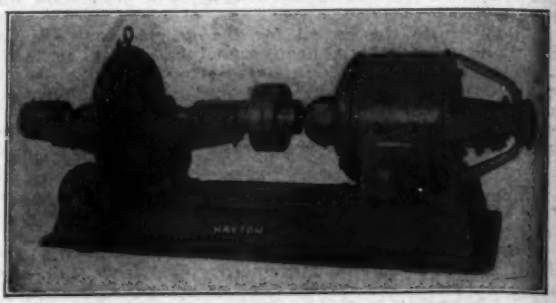
Hayton Centrifugal Pumps

SAVE POWER and MONEY

BY USING



HAYTON CENTRIFUGAL PUMPS

"With us it is an engineering problem"

Designed especially to meet the requirements of pulp and paper mills. We do not build a pump after OUR ideas and then try to sell it to you. We make a study of YOUR peculiar problems, and then build a pump to suit your needs. Hayton Pumps are built for hard, continuous operation, and will stand up under the most severe usage. We guarantee the highest efficiency, and maximum economy in power consumption.

We also build a full line of Sandusky Triplex pumps.

Let us have your specifications for quotations

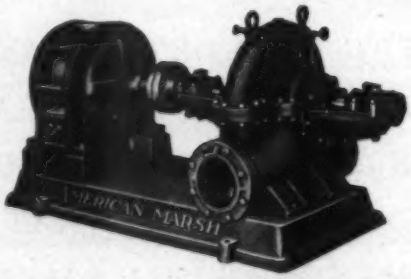
Hayton Pump & Blower Co.

Manufacturers

APPLETON, WISCONSIN

American-Marsh Paper Mill Pumps

Centrifugal and Direct Acting



ESPECIALLY adapted for paper mill service where absolute reliability and high efficiency are required. There is an American-Marsh pump for every paper mill requirement, from draining the rolls on the dryers to handling heavy paper pulp stock.

Because of the fact that the factory is located in the heart of the largest paper mill district in the world, we have always made a specialty of paper mill pumps and our designs are the result of careful first hand study of the actual requirements.

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GRAND CENTRAL PALACE
NEW YORK CITY
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The line includes

Boiler Feed Pumps	Jet Condensers
Centrifugal Pumps	Air Compressors
Stock Pumps	Vacuum Pumps
Deep Well Engines	Power Pumps

May we send you our general catalog?

American Steam Pump Company

Battle Creek, Michigan

One of the most important purchases of British Columbia timber land for some time past has just been consummated by the sale to the Pacific Mills, Ltd., of Vancouver and San Francisco, of a large tract of merchantable timber holdings in the Queen Charlotte islands. The deal involves an expenditure of approximately $1,500,000, sale being made by the North American Timber Holding company.

It is reported that the Standard Paper Co., of Kalamazoo, will declare a 100% stock dividend to holders of common stock in the concern. Application has been filed through the office of the Secretary of State for an increase of capital from $360,000.00 to $720,000.00. As soon as this is acted on by the Michigan Securities Commission, dividends will be available.

An indication of the improvement in the equipment business, was shown in the announcement by the American Locomotive Co., that it had received several orders for locomotives, among which was one from the Hammermill Paper Co., of Erie, Pennsylvania, for a one, four-wheel switching locomotive.

It is reported that the Philadelphia Paper Manufacturing Co., of Philadelphia, has awarded a contract for a new plant to cost about $60,000.00.

The available pulpwood of British Columbia is placed at 225,000,000 cords by C. J. Kay, president of the Canadian Paper Trade association.

Fred LaBrot Appointed Mill Manager

Fred LaBrot has been named mill manager of the Stevens Point division of the Consolidated Water Power and Paper Company, Stevens Point, Wis., to fill the vacancy created there when manager Frank Youngman was chosen to handle the interests of the Consolidated company in Canada. Mr. LaBrot has long been connected with the Wisconsin Rapids division and has served in many capacities, having been for many years in the sales department. About a year ago, he was transferred to the production end, which has equipped him for the larger responsibilities of mill manager.

Mr. Youngman, who has been with the Consolidated Company for the past five years, will move to Canada and be located at Port Arthur, Ont., where the Consolidated Company recently purchased a large pulp mill which will be known as the Thunder Bay Paper Co. Besides managing the mill there, Mr. Youngman will also have charge of the timber lands, tug lines and other interests located in Canada.

P. F. Griffin

P. F. Griffin, secretary and general manager of the Ft. Wayne Corrugated Paper Co., passed away at his home in that city on June 21, 1922, following a stroke of apoplexy suffered that morning while at his office. Mr. Griffin, who was 52 years of age, had been in failing health for some time, but had been able to attend to his office duties regularly.

Mr. Griffin became manager of the Ft. Wayne Corrugated Paper Co. in 1909, when that company was a comparatively small concern. The growth of the company to its present standing as one of the foremost producers of corrugated and fibre boxes, has been made during the period of Mr. Griffin's management.

Before coming to Ft. Wayne, Mr. Griffin had been connected with the American Straw Board Co. and was regarded by his many business associates, as one of the foremost authorities in the manufacture of fibre boxes in this country.

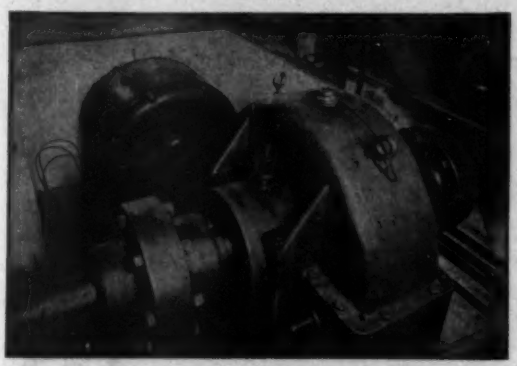
William R. Crump

William R. Crump, manager of the New York office of the Martine Cantine Paper Company, of Saugerties, N. Y., manufacturers of surface coated paper, died in the office of Dr. Willis A. Wilder at 116 Nassau street, New York, on the night of June 9. Dr. Wilder stated that Mr. Crump complained of indigestion when he entered the office, and after being treated he collapsed and died of heart attack before Dr. Wilder could do anything for him.

Mr. Crump was 58 years old, and resided in Brooklyn, N. Y. He had been with the Martine Cantine Paper Company for 25 years. A widow and two sons survive him. His body was taken to Saugerties for burial.

John J. Spinelli, of Atterbury & McKelvey, Inc., dealers in and importers of papermakers' supplies of 145 Nassau street, New York, was married on June 11 to Miss Mary E. McGrath, of Brooklyn, N. Y., and spent several weeks with his bride in the West on a honeymoon trip.

Cleveland WORM GEAR REDUCTION UNITS



Cleveland Worm Gear Reduction Unit applied to mill line shaft. Motor 400 H.P.

High Speed Motors *plus* Cleveland Worm Gear Reduction Units

MEAN both initial and permanent economy. Cleveland Worm Gearing of correct design and right tooth pressure gives a more even flow of torque than is secured by any other device and handles abnormal gear ratios with ease.

Of course the design of tooth and worm and proper materials and proper cutting are of utmost importance. Those who know what has been done with properly designed worm gearing under the extraordinarily rigid demands of motor truck service with its sudden application of torque will appreciate in some measure the remarkable advance made in industrial worm gearing.

It will be perfectly clear to you why we are able to prove high efficiency; low cost of upkeep; freedom from vibration; greater compactness; greater silence; positive lubrication and low upkeep cost.

Write us for latest worm gear data and put your speed reduction problem up to us.

The Cleveland Worm & Gear Co.

America's Worm Gear Specialists

CLEVELAND, OHIO

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Cleveland, Indianapolis, Philadelphia

New England Representatives
FRANKLIN MACHINE CO.....Providence, R. I.

Pacific Coast Representatives
ALFRED H. COATES CO.....San Francisco, Cal.

Rocky Mountain States Representatives
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THE NEWPORT COLORS *for Paper*

We wish particularly to call your attention to two especially good products for paper

Newport Fast Blue R W
Good to Light

Newport Direct Dark Blue H P
Level Dyeing, High Tinctorial Power.

Newport Chemical Works, Inc.
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Largest producers in the world of highest grade Brimstone —guaranteed 99½% pure—free of Arsenic and Selenium.

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UNION SULPHUR COMPANY

In so far as possible we will be glad to offer advice or suggestions to prospective buyers who are using or may be contemplating the use of brimstone.

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Soda Ash 58%
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Special Alkalies

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Our complete Works, located at Painesville, Ohio, directly situated on three Trunk Line Railroads, are in position to serve you to advantage.

Address inquiries and communications to our general offices at

PITTSBURGH PENNSYLVANIA

D. B. Morris has resigned from the Oxford Paper Company after being with that company for fifteen years and has entered into an enterprise of his own as a manufacturers' selling agent with offices at 120 Milk street, Boston, Mass. Mr. Morris has been manager of the purchasing department of the Oxford Paper Company since 1907. In his new enterprise he will supply various raw materials and other articles to paper and pulp mills. One of the accounts he will handle is that of the Kalbfleisch Corporation, of New York, manufacturers of and importers of chemicals used by paper and pulp manufacturers, including casein, china clay, sulphate of alumina, satin white, etc. He has also effected arrangements to represent a large coal concern for the sale of this commodity to paper and pulp mills.

I. S. Reynolds, for the past three or four years manager of sales for the Groveton Paper Company and the Claremont Paper Company, with offices in New York City, has purchased an interest in the paper jobbing firm of Coy, Hunt & Company, of 392 Lafayette street, New York, one of the oldest and best known paper houses in the eastern metropolis, and at a recent meeting of the directors of the company was elected vice president and general sales manager. In his new connection, Mr. Reynolds will have full charge of the selling end of the business, for which work he is particularly well qualified, having proven his ability as a salesman in recent years in disposing of the product of the two aforementioned mills having a daily output of 150 tons of paper.

Milton L. Macauley, formerly New York manager for Auer & Twitchell, of Philadelphia, has formed a new concern to be known as the M. L. Macauley Company with offices at 30 East Forty-second street, New York, which will represent several paper mills in the metropolitan territory. One of the accounts secured by Mr. Macauley is that of the Schmidt & Ault Paper Company, of York, Pa., manufacturers of coarse papers, box boards, etc., which he will represent as sole selling agent in New York City.

Leonard H. Bogart has resigned as secretary and general sales manager of W. M. Pringle & Company, Inc., paper jobbers of 27 Howard street, New York, to become affiliated with the Milton Paper Company, of 110 Greene street, New York. In his new connection Mr. Bogart will devote his entire time to creating new lines and handling of the selling end of the business. Al Miller has been appointed general sales manager of the Pringle Company to succeed Mr. Bogart. Mr. Miller has been connected with the firm for several years.

A cablegram of a single word announced the safe arrival on Tuesday, June 20 of Dr. Hugh P. Baker, Executive Secretary of the American Paper and Pulp Association and George W. Sisson, Jr., of Potsdam, former president of the Association, at Gothenburg, Sweden. They will make their headquarters at Stockholm during their stay in Sweden, Norway and Finland.

Thomas W. Williams, night superintendent at the Radnor Pulp Mill, of the Jessup & Moore Pulp and Paper Co. at Elkton, Maryland, recently suffered a painful accident. Mr. Williams was in the act of helping one of the employees with an acid pipe, and when the sediment became loose, acid flew out with considerable force, striking him in the breast, arms and face. His eyes were also injured.

Thomas W. Cole recently joined the staff of the Hudson Trading Company, paper dealers and importers of 300 Madison avenue, New York, in the capacity of manager of the wrapping paper division. Mr. Cole has been identified with the coarse paper trade for some years, and in his new connection is enabled to give greater service to his customers and friends than ever before.

George C. Russell, who for the past fourteen years has been manager of the Barrett Company's roofing paper mill in Elizabethport, N. J., recently resigned. Mr. Russell plans to return to his home town, Erie, Pa., for a rest before entering in a new line of endeavor.

Emanuel Salomon, vice president of the American Woodpulp Corporation, 347 Madison avenue, New York, sailed for Europe on June 14 on a business trip. He expects to be abroad for five or six weeks.

Mr. F. W. Becker, formerly Secretary of the Fox River Paper Co., Appleton, Wis., has now become associated with Bradner Smith & Co., wholesale paper merchants of Chicago.

Is Standardized Cooking Possible?

No two men will cook a digester the same. But by having each follow a standard method, the results will be sufficiently uniform to effect substantial economies.

Guided by Foxboro Temperature and Pressure Recorders on the digester and a Pressure Recorder on the steam line to the digester, it is possible to follow the most efficient and economical cooking practice day after day, with surprising accuracy.

The design and construction of Foxboro Recorders make them particularly suitable for this important service. Their bulbs are protected from breakage and are not affected by acid. Though exceedingly accurate, Foxboro Recorders are strong and durable. They are capable of giving long, thoroughly dependable service under the severest working conditions.

Let us tell you more about Foxboro Pressure and Temperature Recorders. Write to Dept. "B.B."

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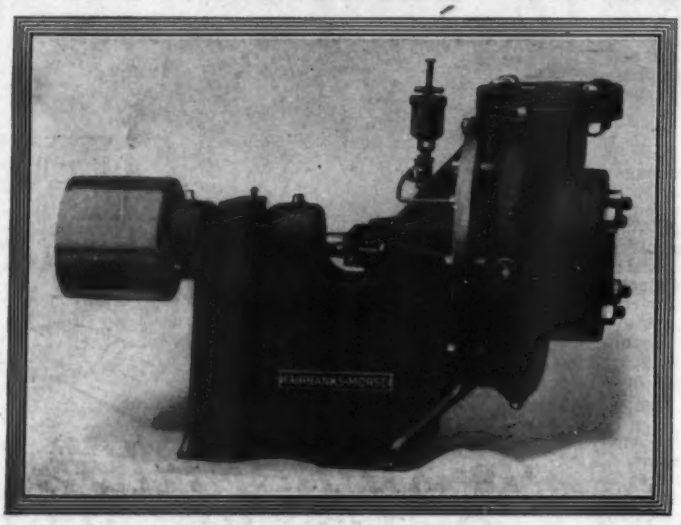
Fairbanks-Morse Pumps



This Pump Will Give Steady Service on Low Pressure Jobs

An open impeller type centrifugal pump that is rugged, durable and will perform efficiently and continuously on low pressure jobs. It is especially designed to give you a good pump at low cost.

Fairbanks-Morse pumps will give you high efficiency whatever the job—there is a type for practically every service, each one the embodiment of the essentials that make for high efficiency.

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MANUFACTURERS CHICAGO
THE CANADIAN FAIRBANKS-MORSE CO., LTD., MONTREAL

Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

The BLACK-CLAWSON Co.
HAMILTON, OHIO

Builders*—Paper and Pulp Mill Machinery—*for
INCREASED PRODUCTION **SERVICE ALWAYS**

New Edition of "American Research Chemicals"

The compilation of research chemicals which was prepared by Clarence J. West for the Committee on Research Chemicals of the American Chemical Society and the Research Information Service of the National Research Council has just been issued in revised form as Number 35 of the "Reprint and Circular Series" of the National Research Council. The marked advance shown by the American chemical industry during the last few years is evidenced by the surprisingly large number of high grade chemicals listed in this publication as now purchasable from American manufacturers. The so called "heavy chemicals" have been omitted because there are so many recognized manufacturers and dealers from whom they may be secured. For the same reason practically all inorganic salts are omitted.

Nearly three hundred research chemicals, not included in the first edition, have been added in this revised list. Many additions have also been made to the list of biological stains and indicators, while a list of dyes that have been carefully purified for use as vital stains has been added. The list of hydrogen ion indicators has been very much extended and a chart of these showing the hydrogen ion concentration range added.

It is recognized that the list may have shortcomings and constructive criticisms and additions will be welcomed. Those interested in this booklet may secure a copy from the Research Information Service, National Research Council, Washington, D. C.

Electric Furnace Catalogs

Two new catalogues have recently been issued by the Electric Furnace Construction Company of Philadelphia, one on Electric Furnaces for Melting, Refining and Superheating of Iron and Steel, describing various types of electric furnaces and particularly a new feature of the "Greaves-Etchells" steel melting furnace applied to four or more electrode furnaces. This system permits of all the electrical power being put either entirely through top electrodes or, by change of position of the switch, through top electrodes and through the whole of the furnace hearth, each connection being so arranged as to give a balanced load and a high power factor.

This gives a very flexible electric melting unit, having all the advantages of top electrode furnace for melting down, and top and bottom heat for the refining and addition of alloys and finishing off. This bottom has been found extremely beneficial during these latter operations, giving as it does slow circulation of the molten bath from the bottom, uniform temperature throughout, and a homogeneous finished product.

The other catalogue describes the "Electro" Steam Boiler, developed by Mr. F. T. Kaelin, Chief Engineer of the Shawinigan Water & Power Co. These electric steam boilers take high tension current direct and use the water itself as a resistance. In the last year approximately 150,000 kilowatts of boilers have been installed or are on order. These boilers have a thermal efficiency of over 98% and a unity power factor, and would be of interest to all hydro power companies or consumers of power who pay on peak or connected load basis, particularly if the standby charge is high and the energy rate low.

"Regulating Boiler Feed Water," is the title of a booklet which has just been published by the Northern Equipment Company, Erie, Pa. The subject has been treated in an entirely new way, the object being to cover the subject of boiler feed water regulation completely and yet very briefly. To accomplish this purpose, free use has been made of a graphical method of presentation: charts showing the effect of feed water regulation on water input, steam output, feed water temperature, etc., also other charts, photographs, etc. There are only twenty pages and the booklet can be read in less than fifteen minutes.

A line of velocity stage turbines especially designed for high pressure and high temperature steam is described in a 28-page catalog isued by the De Laval Steam Turbine Co., of Trenton, N. J. The cast steel steam chest is located in the casing cover in order to avoid the conduction of heat to the bearings. In addition to the speed governor and governor valve, there is an independent valve controlled by an automatic overspeed trip. The turbines are built in sizes up to 1200 hp., and are designed to be directly coupled to high speed centrifugal pumps and blowers, small AC and DC generators, and by means of double helical speed reducing gears, to large pumps and blowers, medium size generators, belt pulleys, rope sheaves and slow and moderate speed machinery.

Ultimate Economy

IN

POWER TRANSMISSION MACHINERY is not determined by the purchase price alone; but is arrived at, by dividing the purchase price by the number of years of continuous and uninterrupted service the Transmission Machinery gives you.

Our appliances are so designed and constructed that the length of service they render is measured only by the life of the plant in which they are installed. Even then they ofttimes may be transferred to other fields of usefulness, so that their final cost is so small as to be almost nil.

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It contains some interesting and useful data on POWER TRANSMISSION APPLIANCES and the problems which beset the user.

T. B. WOOD'S SONS CO.
CHAMBERSBURG, PA.

POWER TRANSMITTING MACHINERY

"STEEL MIXTURE"

A Boiler Furnace Lining characterized by high heat resistance, large blocks, few joints and hard, smooth surface. Each setting is built to fit exactly the dimensions of your furnace.

Boiler Door Arches last from two to ten years.

Fire Box Blocks more than double the life of ordinary fire bricks.

Back Combustion Arches last as long as the boiler.

Blow-Off Pipe Protectors are good for years (set up in a few minutes).

"Steel Mixture" boiler settings now in use in more than 9,000 plants and we guarantee satisfaction if installed in yours.

We also make Standard Fire Bricks, Boiler Baffle Tiles of all kinds and the "Steel Mixture" High Temperature Fire Cement. We ship on receipt of order.

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NEW YORK BOSTON DETROIT

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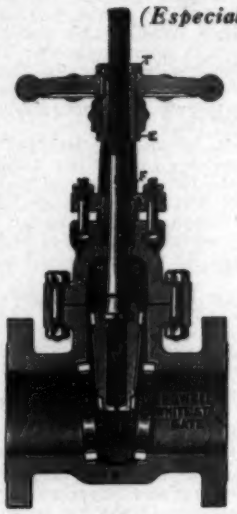

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Gate valves with rising or non-rising spindles.

Screwed or flanged ends, in brass, iron or steel.

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White Star Gate Valves
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Price Reduction *Effective June 1st, 1922*

INCREASED production due to expanding business on Federal-National Multiphase, time limit powder packed renewable fuses has made it possible for us to offer you a further saving—this time in first cost—by reducing list prices June 1, 1922. Send us your specifications for detailed estimate—TODAY.

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San Francisco, Calif.

130 West 42nd Street
New York City

BRANCHES IN ALL LARGE CITIES

The Combustion Engineering Corporation, of New York City has just issued a booklet relative to their powdered coal installation at the River Rouge plant of the Ford Motor Company. While it is in substance a reprint of their previous Ford booklet, it contains some very interesting information on operating results at this plant, which has been in operation slightly over a year. These data show that the operation of this plant has been strikingly successful and has fulfilled all that was expected of it. It is worthy of note that one of the boilers has been up to 425% of rating for a short period which represents considerably over 10,000 developed horse power. While this rating was not obtained for long, the only reason that it wasn't, was that the steam could not be used.

The Thwing Instrument Company, of Philadelphia, have issued Bulletin No. 11, which describes their very complete line of indicating and recording radiation pyrometers. The Thwing electrical pyrometers and thermometers include indicating and single or multiple-recording instruments for measuring all temperatures between —250 degrees and +3000 degrees Centigrade, or their Fahrenheit equivalents, —240 degrees and +5500 degrees. Seventeen years of pyrometer development and invention, under the direction of Dr. Charles Burton Thwing, have brought these instruments to a high state of efficiency and reliability.

A petition in bankruptcy was filed on June 21 against Shuttleworth, Keiller & Company, Inc., paper merchants of 474 West Broadway, New York. Liabilities are put at about $100,000 and assets at about $30,000. Judge Manton appointed John O'Connor and Frank Moore receivers under $15,000 bond. The corporation acted as selling agent for the Kolb Carton Company, Inc., of Norwich, Conn., against which a petition in bankruptcy was filed on May 26, and also was interested in the Ironside Board Corporation, of Norwich, Conn., against which a petition in bankruptcy was filed recently.

The Economy Fuse & Mfg. Company of Chicago, Illinois, announces the appointment of Mr. Chas. H. Bluske as District Sales Manager of the Los Angeles office at 1304 Maltman Avenue. Mr. Bluske was formerly connected with the Pacific States Electric Company of Los Angeles, and succeeds Mr. Geo. L. Davis. The Pittsburgh Sales Office of the Economy Fuse & Mfg. Company has been moved from 2223 Farmers Bank Building to 1006 Peoples Bank Building at Fourth Avenue and Wood Street.

The Stevens & Thompson Paper Company, of Hoosick, Rensselaer County, N. Y., was recently incorporated under New York state laws with a capitalization of $1,500,000. The new corporation is a consolidation of the Stevens & Thompson Paper Company and the Walloomsac Paper Company, and the incorporators were F. L. Stevens, F. N. Stevens, and H. B. Thompson.

The Stevens Paper Company, of New York City, was recently incorporated under New York State laws with a capital of $50,000 to represent paper mills in the sale of paper. L. L. Stevens, Jr., R. A. Smith and J. S. Beach were the incorporators.

The Allied Paper Mills, Inc., paper dealers of New York City, is now occupying its new warehouse at 471-473 Eleventh avenue, which has seven floors and a basement. The offices of the concern are also located at the same address.

The Schmidt & Ault Paper Co., York, Pa., announce the appointment of M. L. Macauley & Company, 30 East 42nd Street, New York City, as their selling representatives in the territory of Greater New York.

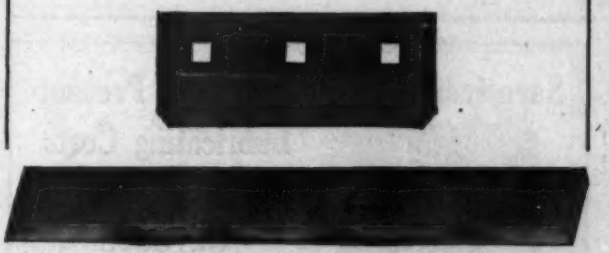
The Ireland & Nelson Paper Company, Inc., of New York City, jobbers and mill agents, has filed notice of a change in name to the A. G. Nelson Paper Company.

Philadelphia Graphic Arts Exposition

A revelation of the magnitude and possibilities of the Graphic Arts will be made at the Philadelphia Graphic Arts Exposition to be held in the Commercial Museum of that city, in September.

Although the show is several months off, plans are already well defined for a complete showing of the newest and best in Graphic Arts in its various phases of equipment, craftsmanship, raw materials and the finished products. The purpose of the display is epitomized in its slogans: "Good

SIMONDS
MANUFACTURING COMPANY
Machine Knives
FOR
Paper and Pulp Mills



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is a hard stock to handle or get a profit from unless you use

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Their use means a smaller pile of waste, but a larger pile of money in the bank

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Save from 1/3 to 1/2 of Your Present Lubricating Costs

"SHURFLO"

Wick *Feed*

OIL CUPS

Will do it for you and keep them cool and easy running. Made in ½-oz., 1½-oz., 3-oz., 5-oz., and 10-oz. capacities. All sizes sent on a 60 days' free trial. Folder free.

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A. D. COOK, Inc.

Lawrenceburg **Indiana**

FIG. NO. 30

Manufacturers of Deep Well Pumps, Working Barrels, Rods, Foot Valves, Strainers and a full line of Water Well Supplies.

The accompanying half tone shows the COOK Patent Brass Tube Well Strainer with Standard Fittings, which are Bail Plug in the bottom and Foot of Blank and Lead Packer on top.

When the COOK Strainer is properly selected for the water bearing sand, capacity and method of pumping, it will successfully deliver the maximum yield of the well for many years free from sand and the troubles incident thereto.

Write for Bulletin 30A

PAPER Men Told Me I Ought to Advertise This

As you know, the Neenah Brass Works does a great deal of work for paper mills. In studying acid-proof metals and repairing valves, etc., I hit upon a new type.

"Great!" a local paper mill man I knew said, "Give us one." It worked like a charm, making him a lot of money.

Then I received orders for valves from his friends in the business. Whenever mill men by chance happened to see it, they ordered one. "You ought to advertise that blow-off valve of yours," I was told. So here it is. It has made money in every mill it has been placed in. I think it will in yours.

Tear off this coupon and mail it, and I will give you all the facts. Better still, give me some dope about your mill, and I'll figure out for you what it will do. There the coupon is—in the lower right-hand corner.

Henry Horkman

The Neenah Brass Works

Neenah, Wisconsin

The Horkman

Improved Safety Blow-off Valve

Made in 8, 10 and 12 inch sizes. Blueprints and specifications furnished upon application.

HENRY HORKMAN,
Dept. 45,
Neenah Brass Works, Neenah, Wis.
Tell us about the Horkman Safety Blow-off Valve.
Name .....
Address .....

equipment, good craftsmanship, good ink, good paper," and "by all means use good printed matter."

The show will be a telling exposition of what private initiative can do and will carry with it the substantial weight and prestige that goes with the endorsement of the Philadelphia Typothetae and the Advertising Crafts Club.

The exposition is in the capable hands of J. H. Goodwin, its active organizer, former advertising manager of the Kansas City Post and now publisher of the Textile Digest, who has achieved a considerable reputation for his successful directing of some of the largest expositions ever held in Philadelphia.

Although the Commercial Museum has the largest floor space of any exposition building in the country, the success of the show is already indicated. Mr. Goodwin announces that one-fourth of the available space has already been contracted for, despite the fact that the prospectus and other literature concerning the show will not be available for a short time.

Newsprint Rises to $75 Per Ton, July and August

The price of newsprint paper has been advanced for the months of July and August from $3.50 to $3.75 a hundred. This announcement has been made by the International Paper Company and the Canadian Export Company has followed suit. No figures are given on what the upward tendency will mean in the price of paper after August 31.

It was reported that the increase was due to the growing demand for newsprint, compelling the starting up of several higher cost mills to meet the emergency.

Market Prices for Machine Wires

The Armstrong Bureau of Related Industries for its clients, the manufacturers of machine wires, furnishes for publication the following prevailing market price information on brass Fourdrinier wires (new standard) as last quoted to the trade by the respective sellers and cleared through the Bureau:

	Price per sq. ft.
No. 60 mesh	50c- 51c
No. 65 mesh	52c- 53c
No. 70 mesh	56c- 57c
No. 75 mesh	59c- 62c
No. 80 mesh	61c- 72c

Plans are being prepared to build a new pulp and paper mill to cost $4,000,000, on the Elk River, about three and one half miles from Elko, B. C. The name of the company will be the Wigwam Paper and Pulp Co., with head offices in Waldo, B. C. The manager, pro tem, is C. D. McNab, of Waldo, B. C. The architect for the new mill has not yet been commissioned, but the company has engineers who are examining the Elk River for sufficient available timber for pulp supply.

A threat to reduce the entire paper tariff, in order to meet the demands of the western republican and the democrats who hope to use high tariff as a campaign issue the coming fall, has featured activities in Washington in the last few weeks. The Senate Finance Committee has begun modifying many other schedules, for political effect, and the report that paper was to be a victim of this wholesale slaughter took officers of the American Paper and Pulp Association to Washington to endeavor to prevent such action.

Standard Ultramarine Blues
For the Paper Industry
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The Highly Alum-Resisting Ultramarine
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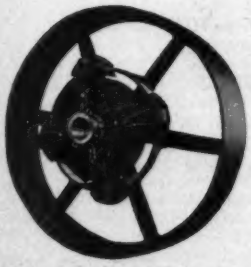
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Easy Bleaching Sulphite
Strong Unbleached Sulphite

PULP

"Hurum"
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Extra Strong Kraft; Bleached and Bleachable Sulphate
"Edsvalla" 50% Moist
"Dejefors" Dry
White Spruce Ground Wood

Tonnages available on dock for prompt shipment

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200 FIFTH AVENUE NEW YORK CITY

The
Hinde & Dauch Paper Co.

Corrugated Fibre Shipping Boxes and Packing Materials of Acknowledged Superiority

Sales offices in principal cities

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SANDUSKY, OHIO

Paper Stock

Now Is the Time to Buy Our Raw Materials

Out of the forty different kinds of paper stock graded in our many large warehouses, you are assured a steady, reliable source for procuring raw materials in practically every branch of paper making.

Having specialized for 35 years in this one field you can depend upon a clean, well-packed, uniform product throughout; fulfillment of delivery promises; and because of our output of 300 tons daily, big tonnage at all times.

Write us your wants and we'll gladly send further information.

Mendelson Bros. Paper Stock Co.
910 South Michigan Avenue, Chicago, Ill.
Long Distance Phones: Harrison 240 and 5557.

EASTERN MANUFACTURING COMPANY

BLEACHED SULPHITE

Made from spruce grown in the forests of Northern Maine.

Send for Samples.

EASTERN MANUFACTURING CO.
501 Fifth Avenue NEW YORK

New York, July 1, 1922.

From every aspect, the paper industry is displaying a stronger and healthier condition day by day. Activity in the market is keeping up at a very gratifying rate; thus far the customary slowing down of demand which occurs at this time of the year has been noticeable in only certain kinds of paper; in fact, it can be said that the industry is more active at present than it usually is at the beginning of July when as a rule the summer lull in business has begun to make itself felt. On all sides one hears expressions of confidence regarding the outlook. Nearly everyone in the paper trade is optimistic; optimism in some quarters is bordering onto the extreme, and great things in the way of big business are predicted for the fall even by the most conservative manufacturers and jobbers.

It is likely, of course, that activity in the paper market will simmer down to an extent during July and the first part of August. The time is rapidly drawing near when paper manufacturers close their plants for the mid-summer repair and inventory period, which is necessary regardless of the status of business, and it is at this season of the year that demand for most kinds of paper decreases. The vacation spirit obviously puts a damper on business generally and makes for a reduced consumption of paper. However, opinion in the trade is that business in paper is going to keep up at a rather steady pace all during this summer. As stated above, general expectations are for a little quieter period during the next five or six weeks, but the trade as a unit does not look for matters to slow up to the extent that they usually do during the middle of the summer. Demand for news print is expected to hold up well, and there seems every indication to substantiate this expectation. It is also believed that fine paper consumption and demand will prove to be proportionately better this summer than ordinarily, and that paper boards of various kinds will be in extra good demand. There seems little question but that stocks of paper of every description in jobbing and consuming establishments are at present of light volume. Consumers and jobbers have for months past been buying almost solely to cover direct requirements, and have purposely kept their stocks down to the bone, and for this reason it is expected that demand will hold up relatively better during the next few weeks than is usually the case in mid-summer.

From a statistical standpoint, the paper industry is certainly in a happy state. Latest available figures show that production is at a very gratifying level, approximating very nearly the high water marks reached during the boom period following the war, and shipments from mills to consuming centers not only are keeping pace with the increasing output of manufacturing plants but most kinds of paper are moving from mills in larger tonnage than is being produced, which means, of course, that manufacturers are gradually reducing their surplus stocks. Production of news print in May was substantially above that for April. The Federal Trade Commission's report shows that a total of 129,950 net tons of print paper was produced by United States mills in May, of which 120,654 tons were standard news print. The April output amounted to 11,861 tons of total print paper, and 105,079 tons of standard news. Figures relating to mill stocks show that manufacturers shipped out all of their increased production in May, as stocks held by mills at the end of May were but 24,781 net tons, or slightly less than the 24,874 tons in stock at the beginning of that month.

An interesting, as well as significant, development in connection with the paper industry are the figures just issued by the Post Office Department in Washington relative to the vast increase in postal receipts. The Post Office Department is a fair barometer of business conditions, and everyone in the paper trade is aware of what a large volume of mail matter means to the paper industry. In bad times, people write fewer letters, commercial houses send out a smaller number of catalogues, circulars and other business getters; the mails are not choked with orders, and correspondence which represents the nerve activity of commerce and business is depressed. In other words, consumption of paper, and particularly fine papers which are used for correspondence, bill heads, order blanks, and the like, is at a minimum. When business generally is good, just the opposite is the case. The Post Office Department is rushed with mail matter, and consumption of paper is at a high level. It is therefore interesting to note that postal receipts for the month of May for the nation's fifty largest cities amounted to over $23,000,000, exceeding the record for May, 1921, by over $3,000,000, and amounting to three times the revenue for May, 1909.

Demand for news print is of consistently good character and there is a very firm tone to quotations on print paper. Publishers are ordering paper in a steady manner and are repeatedly coming into the market to secure additional lots of news print needed outside of their contract supplies. No change in prices has been made for the third quarter of the year. Early in June there were some rumors going the rounds of a probable revision in an upward direction in the contract basis, but nothing came of them, and both domestic and Canadian manufacturers are maintaining previous quotations for this quarter. There are many in the trade who frankly say they look for an advance in news prints prices over the last quarter of the year. It is felt that when mills begin to run on higher-priced pulp wood that they will find it necessary to increase prices, especially since demand for news print is in their favor. On the other hand, it can be said that a majority of paper manufacturers are opposed to any revision in print paper quotations this year, unless unforeseen events make a change absolutely essential, as it is felt the market is perfectly stabilized at present and that therefore no alterations should be attempted in prices.

Book papers are gradually improving their market position insofar as concerns consumption and production. Mills making book paper are busier than in a long time, and there is a better demand from consumers, which shows slow though steady expansion. The difficulty book paper manufacturers have to contend with at present, however, is that regarding price. There is not enough business being placed for book paper to keep all the mills of the country running full, and the competition among mills to land as much of the business that is available as is possible is making for much irregularity in prices, and this competition has gradually forced prices down to a point where there is scarcely no profit at all left to producers of the paper. While mills therefore are operating at a fair rate of capacity, few of them are in a satisfactory position for the reason they are marketing their product at cost or less than cost. Machine finished book paper is selling in some cases down to 5.25 cents per pound f.o.b. consuming centers, though between 5.50 and 5.75 cents is nearer the actual market level. Super book is quoted at from about 6 cents a pound upward at delivery points, and coated book at 8.50 to 10 cents per pound.

Fine papers are in comparatively good demand and this branch of the industry is apparently becoming livelier day by day, or at least has been during the last month. Mills are running well and are finding a readier outlet for their paper and at firmer prices. Moreover, the fine paper manufacturers have much to expect during the remainder of the year. Coarse papers are in a mild slump. Demand has eased off as is customary in the summer, and prices evince an easing tendency. One of the largest domestic producers of wrapping papers recently reduced prices half a cent per pound to 6.50 cents a pound on No. 1 domestic kraft wrapping, and 5.50 cents on the No. 2 grade of kraft. The influx of wrapping paper from Sweden and Germany also is hurting the domestic market to no little extent, opinion to the contrary notwithstanding. Tremendous supplies; that is, tremendous in comparison with the normal amounts of such paper as are imported into this country, have been received from outside sources in recent months, and the marketing of this paper has naturally diminished the need for domestic wrapping paper, while the prices at which this foreign paper has been sold have been such as to make it hard for home producers to successfully compete.

The board market is active and is steadily strengthening. Advances have been scored by nearly all kinds of board, more especially the cheaper grades such as news and chip board. Filled news board is quoted at from $40 a ton upward f.o.b. delivery points, and plain chip board at from $37.50 upward. Paper box manufacturers are laying in supplies against early fall requirements and it can be stated that mills are operating at a larger capacity than in some time.

Avoid Rosin Troubles

The trouble you have had in getting a supply of rosin which is uniform in color and quality and whose cleanliness you are sure of is entirely eliminated if you use Hercules Wood Rosin.

The Naval Stores Division of the Hercules Powder Co. can supply you with wood rosin to meet the requirements essential to efficient paper manufacturing. We are glad to co-operate with manufacturers and are always glad to answer inquiries. Write us today.

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SOLE SELLING AGENTS
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Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

What the paper customer does not know!

THE paper user may know a good quality of paper; he may praise the printing surface—its wearing qualities—and its uniform thickness, but he does not know the part that the Fourdrinier wire plays in achieving these results.

The Fourdrinier wire is the very heart of the Fourdrinier machine—it is here that the paper is given form and substance. Any defect in the Fourdrinier wire will be apparent in the finished sheet.

Should a wrinkle occur in the wire, the paper cannot be made uniform in finish and strength—streaks will show.

If a hole occurs in the wire, a hole will occur in the paper.

Should the edges become slack prematurely, the deckle straps will slip and roll the stock under them.

Should baggy spots occur in the wire, uniform formation of pulp is impossible.

Paper of uniform quality requires the use of a firm, uniform Fourdrinier wire; Fourdrinier wire that will run straight and true; that will not form pockets and wrinkles; that will not become slack at the edges prematurely.

Tyler Fourdrinier Wires meet these requirements. A sample for your inspection will be submitted upon request.

Tyler Fourdrinier Wires are woven in any width up to and including 250 inches.

THE W. S. TYLER COMPANY, Cleveland, Ohio

Papermaking Rags

Papermaking rags of practically every grade have enjoyed a broader demand during the past several weeks than probably at any time since the boom period following the war. Consumers have been in greater evidence as buyers and the movement of supplies into mill channels has been of such scope as to have considerable effect on values, with the result prices have gradually advanced until they are at present on levels representing a substantial rise from the low rates prevailing only a short time ago. The condition of the market seems to be very healthy. The uptrend in quotations has been caused almost entirely by increased buying by consumers, and present indications are that if the demand keeps up as it has been recently, higher price levels will be reached.

A rise in rag prices at just this time of the year is something unusual. Ordinarily the spring and early summer witness a rather slow market for papermaking rags, and values are invariably on the downslide, this being due mainly to the fact that available supplies of rags are heavier at this season of the year than at other times. Around Easter the American housewife conducts her spring housecleaning, and the old clothes of the family are dug from closets, cellars and garrets to be turned over to the ragman, while collections of rags the country over are pushed because the collector knows that larger supplies are awaiting him at this season. The result is that rags usually come into grading centers from collection sources in greater amounts than at any other period of the year, and paper manufacturers, realizing this, usually buy cautiously and wait for the abundance of supply to weaken prices.

The increased buying activity during the past few weeks and the spurt in prices is believed by many in the trade to represent the delayed buying which papermakers usually indulge in earlier in the year, and which they hesitated about this year owing to the uncertainty prevailing in the paper industry. At any rate, demand has undergone consistent and appreciable expansion recently, and prices have kept pace with the increase in trade activity. Moreover, dealers in various parts of the country assert that spring collections this year have proved to be lighter than in some years, this being attributed to the low prices which prevailed on rags for a year or more which, it is contended, forced a great many rag collectors to seek other means of livelihood and who therefore were not on the job this spring to gather the usual supply of rags. There are at present signs of some grades of rags being comparatively scarce. There seems little probability of any dire shortage developing, but it would appear that the matter of supply is likely to play an important role in the fixing of prices for some time to come or until prices have been on higher levels for a sufficient length of time to induce some of the collectors and dealers who forsook the rag business during the past year to return and to stimulate collections by those who have remained in the industry. As regards the immediate future of the market, conservative opinion in the trade is that prices will probably soften somewhat during July and August, but a consensus of belief is that a very strong and high market will exist for papermaking rags in the fall, when it is expected demand will reach such breadth as to have great influence on values.

Buying of the low grades of rags as are used chiefly by felt paper mills has been exceedingly brisk. Roofing paper manufacturers in the East and in the Middle West have absorbed supplies freely and in large amounts following a period when they kept almost entirely out of the market. This concerted purchasing has sent prices on roofing rags to higher levels. Sales of No. 1 packing have been recorded at 1.25 cents a pound at dealers' shipping points, and of No. 2 roofing rags at 1.15 cents. Foreign dark cottons, which only recently were readily available to mills at considerable less than a cent per pound ex dock New York, have brought 1.20 cents a pound, and this is about the lowest price which importers will now consider, with some refusing orders at less than 1.25 cents.

New cuttings of all kinds have strengthened in price under a better movement toward mills. No. 1 white shirt cuttings are quoted at 10.50 to 11 cents a pound f.o.b. dealers' points, fancy shirt cuttings at 6 cents, unbleached muslins at 9.75 cents, bleached canton flannels at 9 cents, light silesias at 6.50 cents, washables at 3.75 cents, and other grades at proportionate advances. Old whites are higher at from 6 cents upward for No. 1 repacked stock, and 3.50 to 4 cents for No. 2 repacked whites. Imported rags have advanced along with domestic grades though chief activity in foreign stock has involved low qualities suitable for felt paper mills.

Average quotations f.o.b. shipping points are:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	10.50-11.00
White shirt cuttings, No. 2	5.50- 6.00
Fancy shirt cuttings	6.00- 6.25
Washables, No. 1	3.75- 4.00
Unbleached muslins	9.50- 9.75
White lawns	9.25- 9.50
Overall cuttings, blue	5.25- 5.50
Black silesias	4.50- 4.75
Light flannelettes	8.00- 8.25
Canton flannels, bleached	8.75- 9.00
Canton flannels, unbleached	7.50- 7.75
Shoe cuttings, bleached	7.25- 7.50
Shoe cuttings, unbleached	6.50- 6.75
Light silesias	6.25- 6.50
Linens, No. 1 white, foreign	14.00-15.00
Light prints, foreign	5.25- 5.75
Old Stock—	
Whites, No. 1 repacked	6.00- 6.50
Whites, No. 2 repacked	3.50- 4.00
Whites, house soiled	1.60- 1.75
Whites, street soiled	1.40- 1.60
Lace curtains	3.50- 3.75
Thirds and blues, rough	1.30- 1.40
Thirds and blues, repacked	1.75- 2.00
Black stockings	2.50- 2.75
Cotton canvas, No. 1	3.50- 3.75
White cotton batting	2.60- 2.75
Roofing, No. 1	1.15- 1.25
Roofing, No. 2	1.05- 1.15
Dark colored cottons, foreign	1.20- 1.25
Blue linens, foreign	3.25- 3.75
Grey linens, foreign	5.00- 5.50
White linens, foreign	9.50-10.00
Light prints, foreign	2.00- 2.15

Rope and Bagging

Demand for old manila rope continues unabated and further advancement has been scored by prices on this commodity. Inquiry from consuming sources has been of a rather pressing character, and dealers have not failed to take full advantage of the known wants of buyers and the comparatively small amounts of old rope available to shove prices upward. There have been sales of No. 1 domestic manila rope at above 6 cents per pound at dealers' shipping points; in fact, it is a matter of doubt whether any sizeable lots of rope can now be procured by paper mills at 6 cents as most dealers quote at least 6.25 cents, with some asking even higher figures. Old rope is not plentiful; the market appears to be well sold up, notwithstanding that importations of this article have increased to at least some extent recently. The depression in the shipping industry for months past has reduced the supply of old rope, and dealers register much complaint over the difficulty experienced in locating all the stock desired. Then, too, demand from consuming quarters has been active. Rope paper manufacturers have been busy and have absorbed raw material in consistent fashion and in good amounts.

Old bagging, on the other hand, is quiet and seemingly held in fairly heavy quantities. A larger movement of roofing bagging has been noted, but tissue paper mills are purchasing in limited amounts, and prices are very much in favor of buyers. No. 1 scrap bagging is quoted at one cent to 1.25 cents a pound, depending on the packing, and roofing bagging at 80 to 90 cents a hundred pounds.

F.o.b. shipping point quotations follow:

	New York and Chicago
Gunny, No. 1 domestic	1.10-1.25
Gunny, No. 1 foreign	1.00-1.15
Scrap bagging, No. 1	1.00-1.25

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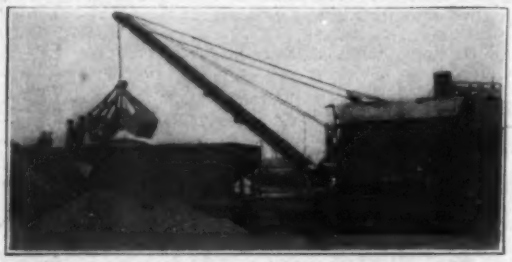

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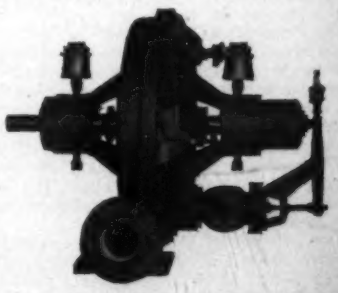

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Roofing bagging	.80- .90
Wool tares, heavy	1.40-1.60
Wool tares, light	1.20-1.40
Manila rope, No. 1 foreign	6.00-6.25
Manila rope No. 1 domestic	6.00-6.25
Sisal strings	1.40-1.60
Mixed strings	.80- .90

Old Papers

A strong and active market prevails for old paper of practically all kinds, and prices throughout the list of grades have shown a steady movement upward. In fact, the strength in waste paper of some descriptions has been rather surprising in view of the situation that has obtained in wood pulp, for which old paper is a substitute, and to many it has been a matter of wonderment why consumers have paid the high prices that have prevailed on the substitute material while being enabled to get the primary article at relatively cheaper costs. Apparently the situation simmers down to that of where paper and board mills which use old paper have continued to do so because they do not care to switch to pulp notwithstanding the proportionate cheapness of the latter, while it also probably is a fact that waste paper is essential in the manufacture of certain kinds of paper and board, as for example board liner, which, it has been proved, is more satisfactory when made of old paper stock than when manufactured of wood pulp.

At any rate, demand for waste paper has been brisk, which, coupled with a comparative scarcity of most grades, has put prices on a good deal higher plane. Packers lay much stress on the small amounts of old paper coming forward from collectors; it is said that only between 30 and 50 per cent of the quantity of waste paper that is normally obtained from printing and publishing establishments is now available, while it is also stated that house to house collections and canvasses of department stores and office buildings are not producing usual supplies of old paper. The result is that packers and dealers are quite bullish in their price ideas and can well afford to be because they have but limited tonnage of paper to dispose of.

At one time during the past few days, No. 1 soft white shavings sold at the same prices quoted on No. 1 hard white shavings, which was a novelty in the waste paper trade, and reflected the active demand and scarcity of the former and the fairly ample supplies of and the lack of buying interest in the latter. Since then prices have become more adjusted, and hard white shavings of No. 1 quality are quoted at 3.75 to 4 cents a pound f.o.b. shipping points, and No. 1 soft white shavings around 3.65 cents. Old books and magazines have been especially strong in price. Mills in the East have been active buyers and have paid fancy prices, up to 2 cents a pound at shipping points having been granted in some cases. Western consumers, however, have mostly been successful in getting books at less than this price, substantially so in a majority of cases. White blank news cuttings are firm at a quoted basis of around 1.75 cents per pound, and old kraft paper is freely bringing 1.80 cents and higher. Folded newspapers are quoted at 70 to 75 cents a hundred pounds, and No. 1 mixed paper at 57½ to 62½ cents a hundred pounds.

Prices f.o.b. shipping points are as follows:

	New York and Chicago
Hard white shavings, No. 1	3.75 -4.00
Hard white shavings, Nos. 2-3	3.00 -3.25
Soft white shavings	3.60 -3.75
Colored shavings	1.35 -1.50
Heavy book, No. 1	1.80 -2.00
Crumpled book, No. 1	1.40 -1.60
Ledger stock	1.85 -2.00
Kraft No. 1	1.80 -1.90
Manilas, No. 1	1.00 -1.10
White blank news	1.70 -1.80
Overissue news, No. 1	.90 -1.00
Folded news	.70 - .75
Mill wrappers	.75 - .85
Box board cuttings	.65 - .70
Mixed paper, No. 1	57½-62½
Common paper	.45 - .50

Chemical Pulp

Reports generally tell of fair activity in the wood pulp market. Consumers are said to be buying in particularly good volume for this time of the year, and the movement toward paper mills clearly reflects the improvement that seems to be daily developing in the paper industry. It would appear, however, that the domestic pulp situation is being seriously affected by the heavy importations of sulphite and kraft pulp from European sources. Consumers in the United States

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are said to be looking more to foreign pulp to fill their requirements than to domestic fibre, and this condition has become so aggravated in certain cases that domestic pulp producers are finding it a difficult matter to operate their plants profitably. Certainly, it would appear that foreign pulp is meeting with a readier and larger sale than domestic pulps, which is all a question of price. Scandinavian and German manufacturers are shipping pulp to the American market at prices which are just sufficiently under those quoted by home producers as to attract most of the attention of buyers here.

While quotations on domestic pulp are fairly well maintained, it is said that some producers are granting concessions in order to get business. This makes for irregularity in prices, and means that quotations are more or less fictitious. Bleached sulphite of No. 1 quality is quoted at 4.50 cents per pound at pulp mills, yet manufacturers in some instances are reported accepting orders at a quarter to a half cent per pound under this level. Unbleached sulphite is quoted at from 2.40 to 2.90 cents a pound, depending on the grade, with sales reported at lower prices. Domestic kraft pulp holds at around a quotable level of 2.75 cents, with extra No. 1 quality kraft quoted up to 3 cents.

F.o.b. pulp mill quotations follow:

Bleached sulphite	4.25-4.50
Easy bleaching sulphite	3.00-3.25
Unbleached sulphite, No. 1	2.60-2.90
News grade sulphite	2.40-2.65
Soda pulp, bleached	3.50-3.75
Mitscherlich, unbleached	3.25-3.50
Kraft, No. 1	2.75-3.00
Screenings, refined	.80-1.00

Mechanical Pulp

Mechanical wood pulp is enjoying a fairly good demand. This is more or less to be expected in view of the activity at newsprint and box board mills, which are the principal consumers of ground wood, and despite fairly heavy supplies at producing centers, quotations are well maintained. There seems no doubt that available stocks of ground wood are fully ample to cover all the requirements of consumers; in fact, it is more than likely that there is a surplus of mechanical pulp at present, but this is usually the case at this period of the year when grinders endeavor to pile up stocks to carry them over the dry season late in the summer. Water conditions have been very favorable during the last several months; the only fault grinders have found has been with too much water, which in some cases has hampered grinding operations to an extent. Sellers seem to be pursuing a cautious policy and are not pressing pulp onto the market with the result they are able to keep prices rather firm.

Quotations on ground wood range all the way from $26 to $35 per ton f.o.b. producing points. Canadian grinders who are situated far away from consuming centers are selling ground wood at $26 to $28 a ton, but the higher freights bring the cost of this pulp to consumers up to the same levels as that purchased at several dollars a ton more in other quarters. An average of domestic quotations is around $30 a ton at grinding plants, at which price basis most of the current business is transpiring. Where producing mills are located near to consuming plants higher prices are being secured.

Chemicals

The proposed duty on imported casein has served to strengthen quotations on this article, and most producers and importers ask a minimum of 10 cents per pound, with quotations ranging up to 13 cents a pound. Bleaching powder is a trifle lower in price at about 1.65 cents a pound for bleach in domestic drums. China clay is moving in fairly large quantities at steady prices, and caustic soda is holding its own in price at from 3.50 cents per pound upward. Soda ash is selling well both for export and for domestic consumption, and quotations are steady at a basis of 1.50 cents a pound.

Average quotations follow:

Alum, lump ammonia	3.50- 3.75
Alum, lump starch	4.00- 4.25
Blanc fixe, powdered	3.75- 4.00
Bleaching powder	1.65- 1.75
Brimstone (long ton, at mine)	14.00-16.00
Casein	10.00-13.00
Caustic soda, spot delivery	3.50- 3.75
China clay, domestic washed	8.00-10.00
China clay, foreign	13.00-18.00
Rosin, grade E	5.20-
Satin white	1.75- 2.00
Soda ash, 58 per cent light (bags)	1.50- 1.75
Sulphite of alumina, commercial grade	1.50- 1.60
Starch, papermakers', in bags	2.40- 2.50
Talc (ton)	14.00-17.00

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SCREENS—Six 10 plate open side Packer, two 6 plate, one Moore & White auxiliary.
STUFF PUMPS—Deane triplex 9"x8", Gould triplex 8"x10", Sandusky trinlex 4"x6".
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SUPER CALENDERS—One 45", one 42", one 36" Holyoke.

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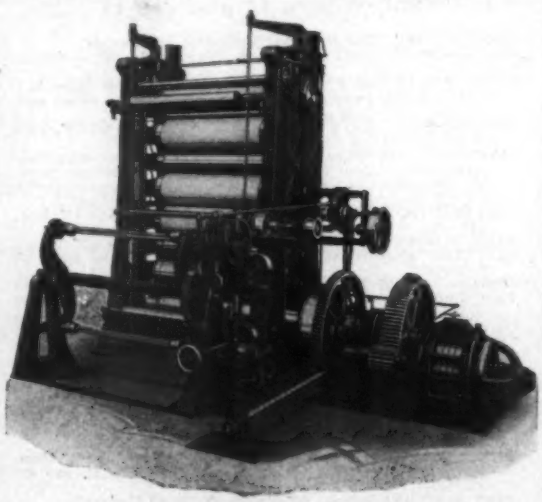

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A SPECIAL filter for paper mills, producing all the results the paper manufacturer desires. It is a modification of the well known Hungerford filter adapted to paper mill use. It is constructed of concrete, strictly wrought iron pipe, brass strainers and especially prepared silica sand. It is as durable and efficient as can be built at any cost. It can be sold at a very low figure.

This filter gives perfectly clear water, washes thoroughly, does not require renewal of the sand bed, is absolutely reliable in the performance of its duty and requires a minimum amount of attention.

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Writing—	
White rag	15-40
White sulphite, No. 1	10-20
Colored	12-40
Ledger—	
White rag	15-50
White sulphite	12-25
Colored sulphite	10-00
Colored rag	10-00
Bonds—	
White rag	13-40
White sulphite	9-20
Colored sulphite	10-25
Colored rag	14-40
Book—	
No. 1 S. & S. C.	6.00- 6.50
Machine finished	5.50- 6.00
English finished	5.50- 6.25
Coated and enameled	8.50-10.00
Lithograph, M. F.	9.00-11.00
Newsprint—	
Rolls, contract	3.50-
Rolls, transient	3.50-3.75
Sheets	4.00-4.25
Side runs	3.00-3.25
Cover Stock—	
Coated, both sides	9.25-
Coated, one side	9.20-
Tissue—	
No. 1 white, 20x30	.80- .90
No. 2 white, 24x36	.70- .80
No. 1 manila, 24x36	.70- .80
Kraft	1.00-1.25
Wrappings—	
No. 1 kraft	6.50-7.00
No. 2 kraft	5.50-6.00
Boards—	New York and Chicago
Solid news	42.50-45.00
Straw	45.00-50.00
Plain chip	37.50-40.00
White coated chip	55.00-60.00
Manila coated chip	52.50-57.50
Binders' board	70.00-80.00

Paper Industry Has Normal Production

"October or late September will probably see the paper industry back to the normal position which it can be expected to maintain through the next winter and spring, at least," says the monthly review of business of the Paper and Pulp Industry, the bulletin of the American Paper and Pulp Association. "This is the indication as the result of the improvement of business during the past two months. In fact the industry is now back to normal production, but with the dull months of summer approaching it is not certain that a maintained prosperity can be achieved before the fall.

"Orders are, however, increasing for the various grades of paper, and the outside statistical agencies are advising the purchase now of some grades to meet the needs to the end of the year.

"Paper production and shipments for March were the largest since October, 1920, according to the Federal Trade Commission reports. The volume of orders and production in the fine paper branch of the industry is now well stabilized, business having been around the 80 percent level from February into June. News print production for March as reported by the United States Department of Commerce, was on an index number of 103, with the 1919 average as the base of 100, and production of other grades was 119.

"Box board is the only weak spot in the industry, this being due to a price war between paper box manufacturers. Coated paper faces the loss of its important export trade if the proposed 4 cent duty is placed on casein, as this would divert the essential Argentine supply to Germany, and enable the Germans to take the export market now held by America."

New French Mill to Make Paper from Grass

The French paper industry is gradually emerging from the crisis caused by the difficulty in obtaining raw material from abroad. Every effort is being made to discover new material with which to manufacture paper pulp. A new company has just been organized under the name of "L'Alfa" with a capital of 8,000,000 francs, according to a report to the Department of Commerce from Commercial Attache Huntington, for the purpose of producing paper pulp from plants, and especially from esparto or alfa grass, which is found in great quantities in Algeria and Tunis. The main office is situated at 124 Rue de la Boetia, Paris.

The new company has leased part of the Sorgues powder factory, near Avignon, and expects to produce pulp within a year. Other experiments are being made with vine shoots and have apparently proved satisfactory. Another effort is being made to acclimatize the Canadian poplar tree in France.

The French shipping company Les Armateurs Francais is organizing a special service for the transportation of chemical wood pulp from Finland to France. The first shipment of 1,556 metric tons of paper pulp has just been discharged at Nantes and Bordeaux, coming from Hango, Finland. France, up to the present time, has depended upon foreign ships for such transportation.

Grosvenor Jones' Efficient Work Recognized

Mr. Grosvenor Jones, Chief of the Paper Division of the United States Bureau of Foreign and Domestic Commerce, has been transferred to the chieftainship of the newly established financial division of the same bureau, in recognition of the efficient work he has done organizing a similar division for the paper industry. At the same time the Paper Division will be enlarged to include printed matter, printing and lithographic machines, etc. These divisions are intended particularly for a development of the country's export trade.

Mr. Jones, who was at one time with the American Paper and Pulp Association, making a study of paper conditions in Latin-America, is possibly even better informed on banking conditions in South and Central America. After his service with the paper industry, he was in Peru in connection with business of the Banco Mercantil Americano of which he was a director. He was at one time assistant director of the Bureau of Foreign and Domestic Commerce, but resigned to undertake a special mission to South America in connection with the Second Pan-American Financial Conference, then going to the Mercantil Bank of the Americas.

He is author of several publications on navigation and shipping, but is a lawyer by profession. An Ohioan by birth, he was a student at Harvard in 1904-05, and took graduate work at Georgetown in 1909.

Motion Picture Service in Demand

The motion picture service of the American Paper and Pulp Association, established as a clearing house for the distribution of existing films owned by various paper companies, was able to place 96 reels of film in eight states during the first six months it has been in operation, and audiences totaling nearly 14,000 have seen the various pictures. This is not a large showing from a motion picture standpoint, but the pictures have gone to clubs, schools, and special groups which were studying the paper industry.

The Information Service of the American Paper and Pulp Association, which is handling this work, could have placed films in twelve state universities for circuit and special call showing through the extension departments of these institutions, had there been sufficient copies of existing pictures to meet the call.

The Association has been co-operating with the United States Department of Commerce in the campaign of that governmental department to place industrial films in South America. Several existing films have been submitted to the department's motion picture section, but those in charge believe that to meet the requirements of the South American market it will be advisable to have a special film produced, by co-operation of several interested mills.

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Wood Pulp

Satisfaction is generally expressed by importers with the prevailing condition of the wood pulp market. Reports invariably say that demand from consuming quarters is good—much better than several months ago—and the volume of pulp moving toward paper mills is said to be showing a steady increase. It would appear, according to representative importers, that paper manufacturers have so firmly held off in purchasing pulp other than that which they immediately needed that now that their requirements are expanding it is necessary for them to broaden their buying of pulp, with the result the market is much more active and prices display a firming tone. No great change has occurred in quotations but it is clearly apparent that the tendency is upward. Importers assert that pulp costs are rising at primary sources—nearly all of the European producing countries naming higher prices than at which they have been marketing pulp here in recent months—which, supported by the increasing demand from consuming quarters, causes importers to assume a more bullish view of the situation.

Latest Government figures show that imports of pulp into the United States are keeping at a fairly high level. A total of 65,141 net tons of chemical pulp and 11,797 tons of mechanical pulp was imported during April, which tonnage, while somewhat under the record-breaking quantities imported earlier this year, was easily double what was considered an average month's supply prior to the war. As illustrating the heavy importations of pulp at present, a comparison of April imports with those of the same month of last year show that almost four times as much chemical pulp was imported in April this year as in 1921, when 17,625 net tons were brought in from outside sources.

Quotations, while evincing a hardening tendency, remain very much on the levels last reported. Bleached sulphite of No. 1 grade is quoted at around 4 cents a pound ex dock New York or other American Atlantic ports, with No. 2 quality bleached sulphite available at 3.50 to 3.75 cents per pound on the dock. Foreign unbleached sulphite ranges in price from 2.25 to 2.60 cents a pound ex dock, depending on the grade, with a strictly No. 1 unbleached generally held at an average of about 2.50 cents. Unbleached Mitscherlich sulphite is selling at about 3 cents per pound ex dock, and easy bleaching sulphite at 2.75 to 3 cents. The quotation on Swedish kraft pulp is well maintained at 2.65 cents a pound ex dock, which is the price quoted by the pulp manufacturers' association in Sweden, but Finnish kraft is being sold in the American market at considerable less than this figure, down to 2.40 cents being mentioned on the latter kind of pulp in some quarters. It is understood that one very large sale involving some 2,000 tons of Finnish kraft pulp was consummated recently at around 2.40 cents ex dock New York.

Receipts at the port of New York in June and current market quotations follow:

Bleached sulphite, No. 1	$ 4.00-$4.25
Unbleached sulphite, No. 1	2.40- 2.60
Easy bleaching	2.75- 3.00
Mitscherlich unbleached	2.90- 3.00
Kraft	2.40- 2.65
Ground wool, per ton	35.00-

J. Anderson & Co., 1,300 bls. from Christiania; Johaneson, Wales & Sparre, Inc., 1,524 bls. from Gothenburg, 400 bls. from Gefle and 1,000 bls. from Norrkoping; Scandinavian-American Market at considerably less than this figure, down man & Co., 2,000 bls. from Gothenburg; Seggerman Bros., 975 bls. from Gothenburg and 750 bls. from Copenhagen; J. F. Patton & Co., 30,833 bls. from Chatham, N. B.; Castle, Gottheil & Overton, 2,975 bls. from Hamburg and 381 bls. from Rotterdam; Lagerloef Trading Co., 4,517 bls. from Hango; Irving National Bank, 4,791 bls. from Hango; Fred Enders & Co., 250 bls. from Hamburg; Mechanics & Metals National Bank, 500 bls. from Gothenburg and 1,000 bls. from Christiania; American Woodpulp Corp., 920 bls. from Rotterdam; A. J. Pagel & Co., 2,625 bls. from Gefle, 7,200 bls. from Hornefors, 3,000 bls. from Husum and 2,250 bls. from Dornsjo; E. M. Sergeant & Co., 750 bls. from Christiania; Whalen Pulp and Paper Mills, 13,260 bls. from Vancouver; Tidewater Paper Mills Co., 1,374 tons from Murray Bay, P. Q., and 7,521 bls. from Liverpool, N. S.; Order, 400 bls. from Christiania, 2,550 bls. from Hallstavik and 2,028 bls. from Hamburg.

Paper Stock

The stronger market for papermaking materials during the past few weeks has been reflected in increased imports of paper stock of practically all kinds. Old rope importations have taken a jump, and more rope was imported in June than probably in any single month in several years. Rag imports also are on the rise, judging from June receipts through the port of New York, where a heavier tonnage of rags came in from foreign sources than in some time. The probabilities are most of the papermaking rags imported last month were of roofing quality, but it is also likely that arrivals of the better grades increased to at least some extent. Importers report a much improved demand for foreign paper stock, and assert that the principal obstacle to broader trading now is that prices on rags, ropes, bagging, etc., at primary sources have risen to levels where it is difficult for them to realize a reasonable profit in bringing material in to sell to paper mills at the prices the latter are willing to grant.

Receipts through the port of New York in June follow:

Old Rope

First National Bank of Boston, 79 bls. from Rotterdam, 55 coils and 40 bls. from Antwerp, 248 bls. and 100 coils from Genoa; Brown Bros. & Co., 391 coils and 31 bls. from Bristol, 408 coils and 58 bls. from Hull and 85 coils from Newcastle; American Exchange National Bank, 190 coils from Bristol and 52 coils from Glasgow; E. J. Keller Co., 146 coils from Cardiff, 117 coils from Antwerp, 117 coils and 78 bls. from Rotterdam, 208 coils from Leith, 193 bls. from Copenhagen, 255 bls. from Algiers and 168 coils from Hull; Ellerman-Wilson Steamship Line, 60 coils from Hull and 88 bls. from London; J. Perlman, 6 bls. from Havana; International Purchasing Co., 198 bls. from Havre; American Express Co., 146 coils from London and 74 bls. from Southhampton; S. D. Harrison, 197 coils from Cork; William Steck & Co., 21 bls. from Rotterdam; N. E. Berzen, 4 bls. from Rotterdam; Equitable Trust Co., 43 coils from Glasgow; Bemis Bro. Bag Co., 457 coils from Hull; W. Schall & Co., 113 bls. from Barcelona; Ladenburg, Thalman & Co., 104 coils from Rotterdam; Pollack Bros., 32 bls. from Rotterdam; M. Wolfer & Co., 3 bls. from Havana; Order, 90 coils from Bristol, 141 coils and 199 bls. from London, 126 coils from Leith and 46 coils from Glasgow.

Old Bagging

Equitable Trust Co., 142 bls. from Manchester; E. J. Keller Co., 292 bls. from Manchester and 267 bls. from Havre; J. J. Patricof Co., 157 bls. from Antwerp; S. Birkenstein & Sons, 63 bls. from London; E. Butterworth & Co., 275 bls. from Antwerp; Mechanics & Metals National Bank, 163 bls. from Manchester; Order, 289 bls. from Liverpool and 673 bls. from Manchester.

Rags

R. F. Downing & Co., 273 bls. from Rotterdam; W. Hughes & Co., 576 bls. from Rotterdam; S. Silberman Co., 701 bls. from Rotterdam; S. Birkenstein & Sons, 65 bls. from Glasgow; J. J. Patricof Co., 697 bls. from Rotterdam and 425 bls. from Antwerp; J. Perlman, 6 bls. from Havana; M. Wolfer & Co., 6 bls. from Havana; Certain-teed Products Corp., 547 bls. from Marseilles; Goldman, Sachs & Co., 481 bls. from Hamburg; E. J. Keller Co., 74 bls. from Hamburg, 734 bls. from Rotterdam, 219 bls. from Bordeaux and 116 bls. from Bremen; Descar Trading Co., 252 bls. from Cardiff and 415 bls. from Bristol; Castle, Gottheil & Overton, 153 bls. from Antwerp, 522 bls. from Bordeaux, 675 bls. from Rotterdam and 54 bls. from Havre; National City Bank, 329 bls. from Hamburg; Irving National Bank, 55 bls. from Hamburg; Daniel M. Hicks, Inc., 23 bls. from Havre; W. Schall & Co., 251 bls. from Havre; Hanover National Bank, 28 bls. from Liverpool; American Express Co., 40 bls. from Havre; Banque National de Credit of Paris, 138 bls. from Bordeaux; Me-

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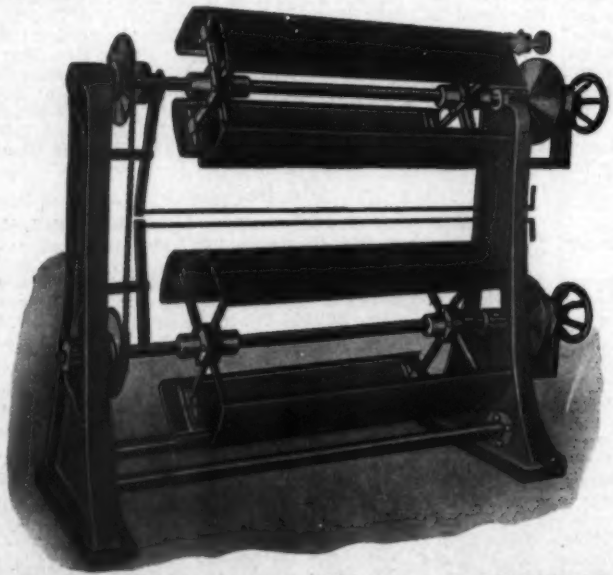

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chanics & Metals National Bank, 319 bls. from Bordeaux and 47 bls. from London; Katzenstein & Keene, 1,384 bls. from Bordeaux; Bankers Trust Co., 301 bls. from Rotterdam; F. P. Gaskell & Co., 57 bls. from Bremen; Paul Berlowitz, 249 bls. from Rotterdam; Chemical National Bank, 270 bls. from Rotterdam; W. Van Doorn, 6 bls. from Rotterdam; Ladenburg, Thalman & Co., 17 bls. from Dundee and 73 bls. from Hamburg; Salomon Bros. & Co., 14 bls. from Hull; Kelly & Co., 9 bls. from Havre; International Acceptance Bank, 179 bls. from Hamburg; George W. Millar & Co., 235 bls. from Rotterdam; Order 222 bls. from London, 2,910 bls. from Liverpool, 614 bls. from Bremen, 264 bls. from Bordeaux, 55 bls. from Antwerp, 5 bls. from Rotterdam, 104 bls. from Havre and 14 bls. from Hamburg.

Miscellaneous Paper Stock

Maurice O'Meara Co., 21 bls. from Manchester and 46 bls. from Antwerp; Irving National Bank, 85 bls. from Manchester; Ladenburg, Thalman & Co., 17 bls. from Glasgow and 97 bls. from Manchester; E. J. Keller Co., 523 bls. from Antwerp and 16 bls. from Glasgow; National City Bank, 200 bls. from Liverpool; Castle, Gottheil & Overton, 99 bls. from Antwerp; R. F. Dowing & Co., 322 bls. from London; Schulz & Ruckgaber, 136 bls. from Liverpool; Mechanics & Metals National Bank, 32 bls. from Antwerp; Order, 51 bls. from Glasgow, 192 bls. from Antwerp and 1,183 bls. from Liverpool.

Paper

Heavy importations of kraft wrapping paper from Sweden and Germany continue to feature the paper import trade of the United States. Shipments of this kind of paper arriving at New York and other American Atlantic ports in June were equally as large as in the preceding month, and many members of the paper trade are puzzled in regard to how the domestic market is absorbing such large quantities of foreign wrapping paper. News print imports continue fairly large but not of as heavy tonnage as a few months ago. In this connection the latest available Government figures show that importations of news print from European countries into the U. S. in January of this year amounted to 11,278 long tons, in February 18,875 tons, in March 4,900 tons, and in April 9,807 tons, which would indicate that imports of foreign print paper are gradually decreasing. During 1921 an average monthly tonnage of 11,278 long tons was imported, Government statistics show. Imports of cigarette, hanging, filter and other kinds of paper in June were about up to normal. Arrivals at the port of New York in June follow:

Cigarette

Hard & Ritter, 50 cs. from Barcelona; American Tobacco Co., 1,900 cs. from Bordeaux, 143 cs. from Dunkirk and 118 cs. from Havre; British-American Tobacco Co., 134 cs. from Liverpool and 101 cs. from Shanghai; Southern Pacific Co., 100 bls. from Genoa; R. J. Reynolds Tobacco Co., 960 cs. from Bordeaux; Ligget & Myers Tobacco Co., 21 cs. from Bordeaux and 13 cs. from Marseilles; Manduet Paper Co., 160 cs. from Marseilles; Hamburg Co., 28 cs. from Havre; W. R. Grace & Co., 20 cs. from Barcelona; P. J. Schweitzer, 72 cs. from Havre; Order, 202 cs. from Barcelona.

Printing

W. F. Etherington & Co., 193 cs. from Glasgow; L. A. Consmiller, 23 cs. from Hamburg; Guaranty Trust Co., 40 cs. from Antwerp; C. K. MacAlpine, 124 rolls and 93 bls. from Gothenburg; Chemical National Bank, 753 rolls from Hamburg; P. C. Zuhlke, 342 cs. from Antwerp; P. Puttmann, 55 cs. from Antwerp; H. Reeve Angel & Co., 9 cs. from Hango and 196 bls. and 236 rolls from Bremen; Perkins-Goodwin Co., 9 cs. from Genoa; B. F. Drakenfeld & Co., 32 cs. from Liverpool; Oxford University Press, 12 cs. from Liverpool; Tamm & Co., 16 cs. from Rotterdam; Irving National Bank, 33 bls. from Copenhagen; Sinclair & Valentine, 24 cs. from Hamburg; E. C. Melby, 221 rolls from Bremen; Virginia Paper Co., 234 rolls from Bremen; Nashua Gummed & Coated Paper Co., 106 bls. from Bremen; Box Board & Lining Co., 147 rolls from Bremen; L. Schulman & Co., 88 bls. from Bremen; American Woodpulp Corp., 234 rolls from Bremen; H. Lips, 61 cs. from Antwerp; Atlantic National Bank, 20 rolls from Antwerp; Chase National Bank, 3,981 rolls from Gothenburg; M. G. Lange & Co., 13 cs. from Bremen; Parsons & Whittemore, 1,051 rolls from Bremen; J. B. Harris Co., 286 rolls from Bremen; Parsons Trading Co., 12 cs. from Genoa; Ladenburg, Thalman & Co., 47 rolls from Hamburg; Steiner Paper Corp., 34 cs. from Hamburg; Order, 660 rolls from Hango, 18 rolls from Hamburg, 1,143 rolls from Kotka, 2,156 rolls from Copenhagen, 2,528 rolls from Bremen and 784 rolls from Gothenburg.

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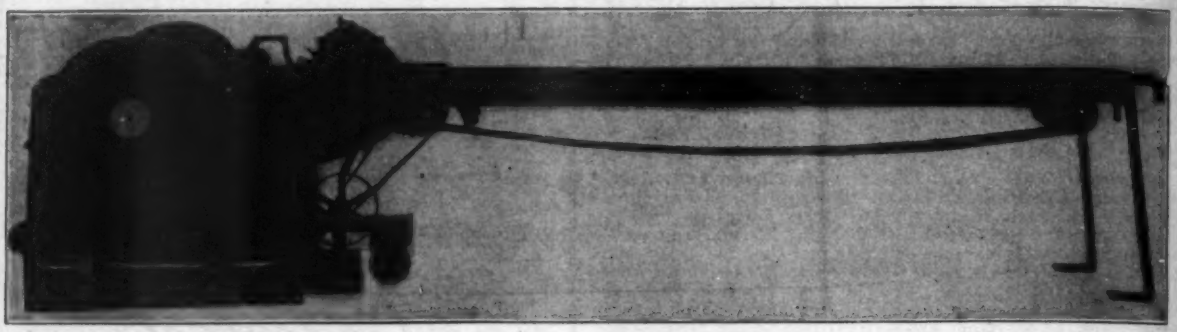

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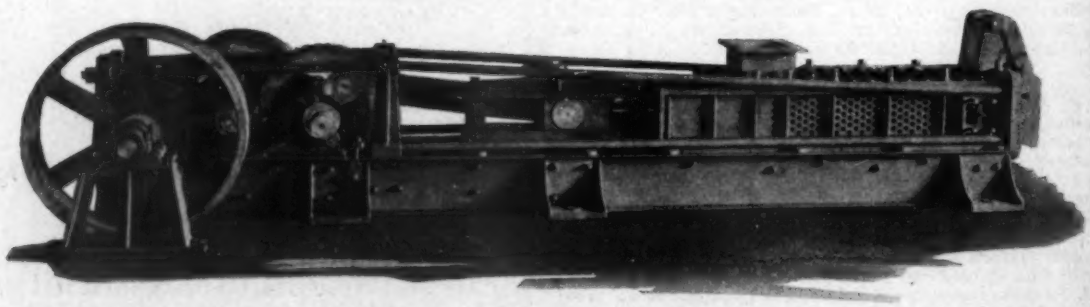

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Hanging

A. C. Dodman, Jr., 9 bls. from Antwerp, 8 bls. from Southampton and 35 bls. from Liverpool; W. H. S. Lloyd & Co., 40 bls. from London; F. G. Prager & Co., 7,490 rolls from Antwerp; M. G. Lange & Co., 5 cs. from Hamburg; F. A. Binder, 13 bls. from Bremen; R. F. Downing & Co., 9 bls. from London and 43 cs. from Yokohama; M. J. Corbett & Co., 3 cs. from Hamburg; A. Murphy & Co., 11 bls. from Havre and 2 bls. from London; R. F. Lang, 610 bls. from Hamburg; W. H. Kimean, 3 cs. from Kobe; Order, 5 cs. from Antwerp and 2,452 rolls from Bremen.

Writing

Irving National Bank, 4 cs. from Antwerp; C. Steiner, 3 cs. from Rotterdam; Louis DeJonge & Co., 37 cs. from Marseilles; L. Bamberger & Co., 12 cs. from Havre; F. C. Strype, 3 cs. from Marseilles.

Drawing

P. Puttmann, 4 cs. from Antwerp; E. Dietzgen & Co., 24 cs. from Hamburg; Lunham & Moore, 24 cs. from London; Keuffel & Esser Co., 4 cs. and 97 rolls from Hamburg and 3 cs. from Antwerp; M. J. Corbett & Co., 2 cs. from Liverpool; A. Giese & Co., 8 bls. from Bordeaux; American Shipping Co., 6 cs. from Hamburg.

Filter

E. Fougera & Co., 55 cs. from Southampton and 60 cs. from Bordeaux; Lunham & Moore, 14 cs. from London; Bernard, Judae & Co., 10 cs. from Gothenburg; G. Lueders & Co., 10 bls. from Bordeaux; R. F. Downing & Co., 68 bls. from London; American Express Co., 2 cs. from Marseilles; O. G. Euler, 35 bls. from Bordeaux; Zinkeisen & Co., 7 bls. from Hamburg.

Tissue

Wilkinson Bros. & Co., 15 bls. from Liverpool; Globe Shipping Co., 58 cs. from Rotterdam; Meadows, Wye & Co., 17 cs. from Liverpool; F. C. Strype, 1 cse. from Liverpool; R. Hoe & Co., 7 bls. from London; Order, 9 bls. from London.

Photo

G. Gennert, 17 cs. from Hamburg; Gevaert Co. of America, 52 cs. from Antwerp; J. J. Gavin & Co., 1 cse. from Liverpool.

Boards

Wiebush Calendar Importing Co., 41 cs. from Hamburg; Metropolitan Importing & Mfg. Co., 31 cs. from Hamburg; C. B. Richard & Co., 13 cs. from Bremen and 4 cs. from Hamburg; Lindt Chocolate Co., 17 cs. from Rotterdam; Irving National Bank, 3 cs. from Hamburg and 36 bls. from Gothenburg; New York Label & Box Works, 9 cs. from Hamburg; Globe Shipping Co., 10 cs. from Hamburg.

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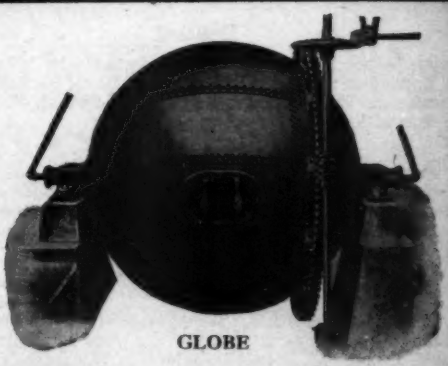

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